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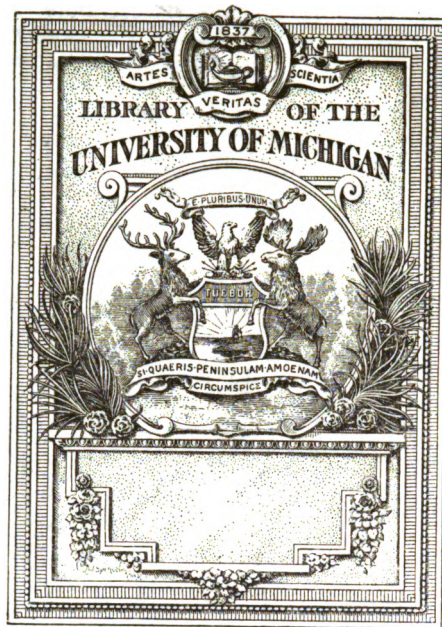
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FIFTH ANNUAL REPORT
OF THE
PENNSYLVANIA
DEPARTMENT OF AGRICULTURE.

PART II.



1899.

WM. STANLEY RAY,
STATE PRINTER OF PENNSYLVANIA.
1900.



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LETTER OF TRANSMITTAL.

Harrisburg, Pa., August 8, 1900

Hon. Wm. A. Stone, Governor of Pennsylvania:

Dear Sir: In compliance with the requirements of the Act of Assembly of March 13, 1895, and of the custom which has prevailed in this Department, I have the honor to transmit herewith Part II of my annual report for the year 1899. The report contains lists of officers of the various State organizations of farmers in Pennsylvania, together with the Acts of Legislature by which the organizations were created, and the constitution, by-laws and declarations of principles under which they act. Some of the papers read before these organizations are included in the report, and also a number selected from those presented at the local institutes during the season of 1898-9.

Respectfully yours,

JOHN HAMILTON,
Secretary of Agriculture.



PENNSYLVANIA DEPARTMENT OF AGRICULTURE.

OFFICIAL LIST.

JOHN HAMILTON, *Secretary*,
State College, Centre County.

A. L. MARTIN, *Dep'y Sec'y and Director of Farmers' Institutes*,
Enon Valley, Lawrence County.

LEVI WELLS, *Dairy and Food Commissioner*,
Spring Hill, Bradford County.

BENJ. F. MacCARTNEY, *Economic Zoologist*,
Hamilton, Jefferson County.

J. T. ROTHROCK, *Commissioner of Forestry*,
West Chester, Chester County.

LEONARD PEARSON, *State Veterinarian*,
Philadelphia.

M. D. LICHLITER, *Chief Clerk*,
Pittsburg.

GEORGE G. HUTCHISON, *Clerk, Dairy and Food Commissioner*,
Warriors' Mark, Huntingdon County.

FRANK S. CHAPIN, *Clerk, Economic Zoologist*,
Milton, Northumberland County.

ROBERT S. CONKLIN, *Clerk, Commissioner of Forestry*,
Columbia, Lancaster County.

LEWIS VANDERSLOOT, *Stenographer*,
York, York County.

GEORGE F. BARNES, *Messenger*,
Rossville, York County.



AN ACT ESTABLISHING THE DEPARTMENT OF AGRICULTURE.

AN ACT

To Establish a Department of Agriculture and to Define its Duties
and to Provide for its Proper Administration.

Section 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same,* That there be and hereby is established a Department of Agriculture, to be organized and administered by an officer who shall be known as the Secretary of Agriculture, who shall be appointed by the Governor, by and with the advice and consent of the Senate, for a term of four years, at an annual salary of three thousand five hundred dollars, and who, before entering upon the duties of his office, shall take and subscribe the oath prescribed in Article seven of the Constitution. Said secretary shall be ex-officio secretary of the State Board of Agriculture, and shall succeed to all the powers and duties now conferred by law upon the secretary of said Board.

Section 2. That it shall be the duty of the Secretary of Agriculture in such ways as he may deem fit and proper, to encourage and promote the development of agriculture, horticulture, forestry and kindred industries; to collect and publish statistics and other information in regard to the agricultural industries and interests of the State; to investigate the adaptability of grains, fruits, grasses and other crops to the soil and climate of the State, together with the diseases to which they are severally liable and the remedies therefore; to obtain and distribute information on all matters relating to the raising and care of stock and poultry; the best methods of producing wool and preparing the same for market, and shall diligently prosecute all such similar inquiries as may be required by the agricultural interests of the State and as will best promote the ends for which the Department of Agriculture is established. He shall give special attention to such questions relating to the valuation and taxation of farm land, to the variation and diversification in the kinds of crops and methods of cultivation, and their adaptability to chang-

ing markets as may arise from time to time, in consequence of a change of methods, means and rates of transportation, or in the habits or occupation of the people of this State and elsewhere, and shall publish as frequent as practicable, such information thereon as he shall deem useful. In the performance of the duties prescribed by this act, the Secretary of Agriculture shall, as far as practicable, make use of the facilities provided by the State Agricultural Experiment Station, the State Board of Agriculture and the various State and county societies and organizations maintained by agriculturists and horticulturists, whether with or without the aid of the State, and shall as far as practicable, enlist the aid of the State Geological Survey for the purpose of obtaining and publishing useful information respecting the economic relations of geology to agriculture, forestry and kindred industries. He shall make an annual report to the Governor, and shall publish from time to time such bulletins of information as he may deem useful and advisable. Said report and bulletins shall be printed by the State Printer in the same manner as other public documents, not exceeding five thousand copies of any one bulletin.

Section 3. That it shall be the duty of the Secretary to obtain and publish information respecting the extent and condition of forest lands in this State, to make and carry out rules and regulations for the enforcement of all laws designed to protect forests from fires and from all illegal depredations and destruction, and report the same annually to the Governor, and as far as practicable, to give information and advice respecting the best methods of preserving wood lands and starting new plantations. He shall also as far as practicable, procure statistics of the amount of timber cut during each year, the purpose for which it is used, and the amount of timber land thus cleared as compared with the amount of land newly brought under timber cultivation, and shall, in general, adopt all such measures as in his judgment may be desirable and effective for the preservation and increase of the timber lands of this State, and shall have direct charge and control of the management of all forest lands belonging to the Commonwealth, subject to the provisions of law relative thereto. The said Secretary shall also be and hereby is charged with the administration of all laws designed to prevent fraud or adulteration in the preparation, manufacture or sale of articles of food, the inspection, sale or transportation of agricultural products or imitations thereof, and all laws relating to diseases of domestic animals, and to the manufacture and inspection of commercial fertilizers.

Section 4. There shall be one Deputy Secretary, who shall be appointed by the Governor for the term of four years, at a salary of three thousand dollars a year, who shall also be Director of Farmers' Institutes. The other officers of the Department shall be appointed by the Governor for the term of four years, and shall be an Economic

Zoologist, a Commissioner of Forestry, a Dairy and Food Commissioner who shall have practical experience in the manufacture of dairy products, and a State Veterinarian who shall be a graduate of some reputable veterinary college, who shall receive an annual salary of twenty-five hundred dollars each. The Dairy and Food Commissioner shall, under the direction of the Secretary, perform the duties prescribed by an act approved May twenty-sixth, one thousand eight hundred and ninety-three. The Governor is hereby authorized to appoint one chief clerk of the Department at an annual salary of sixteen hundred dollars, one stenographer at a salary of eight hundred dollars a year, and one messenger at a salary of six hundred dollars a year, and the Dairy and Food Commissioner, the Commissioner of Forestry and the Economic Zoologist shall each have a clerk, who shall be appointed by the Governor, and who shall serve under the direction of the respective commissioners aforesaid, and receive a salary of fifteen hundred dollars a year each.

Section 5. That it shall be the duty of the Superintendent of Institutes to arrange them in such manner as to time and places of holding the same, as to secure the greatest economy and efficiency of service, and to this end he shall in each county where such institutes are to be held, confer and advise with the local member of the State Board of Agriculture, together with representatives duly appointed by each county agricultural, horticultural and other like organization with reference to the appointment of speakers and other local arrangements.

Section 6. That the Secretary may at his discretion employ experts for special examinations or investigations, the expenses of which shall be paid by the State Treasurer in the same manner as like expenses are provided by law, but not more than five thousand dollars shall be so expended in any one year. In his annual report to the Governor, he may include so much of the reports of other organizations as he shall deem proper, which shall take the place of the present agricultural reports, and of which thirty-one thousand, six hundred copies shall be published and distributed as follows: To the Senate, nine thousand copies; to the House of Representatives, twenty thousand copies; to the Secretary of Agriculture, two thousand copies; to the State Librarian, for distribution among public libraries and for reserve work, five hundred copies, and to the State Agricultural Experiment Station, one hundred copies.

Section 7. That the Secretary of Agriculture shall have an office at the State Capitol, and it is hereby made the duty of the Commissioners of Public Buildings and Grounds to provide the necessary rooms, furniture and apparatus for the use of the Department.

Section 8. That all acts or parts of acts inconsistent herewith be and the same are hereby repealed.

Approved—March 13, 1895.

LIST OF PUBLICATIONS OF THE PENNSYLVANIA DEPARTMENT OF AGRICULTURE.

ANNUAL REPORTS.

- *Report of the State Board of Agriculture, 336 pages, 1877.
- *Report of the State Board of Agriculture, 625 pages, 1878.
- *Report of the State Board of Agriculture, 560 pages, 1879.
- *Report of the State Board of Agriculture, 557 pages, 1880.
- *Report of the State Board of Agriculture, 646 pages, 1881.
- *Report of the State Board of Agriculture, 645 pages, 1882.
- Report of the State Board of Agriculture, 645 pages, 1883.
- Report of the State Board of Agriculture, 648 pages, 1884.
- Report of the State Board of Agriculture, 645 pages, 1885.
- Report of the State Board of Agriculture, 646 pages, 1886.
- Report of the State Board of Agriculture, 650 pages, 1887.
- Report of the State Board of Agriculture, 648 pages, 1888.
- Report of the State Board of Agriculture, 650 pages, 1889.
- Report of the State Board of Agriculture, 594 pages, 1890.
- Report of the State Board of Agriculture, 600 pages, 1891.
- Report of the State Board of Agriculture, 604 pages, 1892.
- Report of the State Board of Agriculture, 713 pages, 1893.
- Report of the State Board of Agriculture, 646 pages, 1894.
- Report of the Department of Agriculture, 878 pages, 1895.
- Report of the Department of Agriculture, Part 1, 820 pages, 1896.
- Report of the Department of Agriculture, Part 2, 444 pages, 1896.
- Report of the Department of Agriculture, Part 1, 897 pages, 1897.
- Report of the Department of Agriculture, Part 2, 309 pages, 1897.
- *Report of the Department of Agriculture, 894 pages, 1898.
- Report of the Department of Agriculture, Part I, 1082 pages, 1899.
- Report of the Department of Agriculture, Part 2, 1899.

* Note.—Edition exhausted.

BULLETINS.

- No 1.* Tabulated Analyses of Commercial Fertilizers, 24 pages, 1895.
- No. 2.* List of Lecturers of Farmers' Institutes, 36 pages, 1895.
- No. 3.* The Pure Food Question in Pennsylvania, 38 pages, 1895.
- No. 4.* Tabulated Analyses of Commercial Fertilizers, 32 pages, 1896.
- No. 5.* Tabulated Analyses of Commercial Fertilizers, 38 pages, 1896.
- No. 6.* Taxidermy; How to collect Skins, etc., 128 pages, 1896.
- No. 7.* List of Creameries in Pennsylvania, 68 pages, 1896.
- No. 8. Report of State Horticultural Association, 108 pages, 1896.
- No. 9. Report of Dairymen's Association, 96 pages, 1896.
- No. 10. Prepared Food for Invalids and Infants, 12 pages, 1896.
- No. 11.* Tabulated Analyses of Commercial Fertilizers, 22 pages, 1896.
- No. 12. Road Laws of Pennsylvania, 42 pages, 1896.
- No. 13.* Report of Butter Colors, 8 pages, 1896.
- No. 14. Farmers' Institutes in Pennsylvania, 92 pages, 1896.
- No. 15. Good Roads for Pennsylvania, 42 pages, 1896.
- No. 16. Dairy Feeding as Practiced in Pennsylvania, 126 pages, 1896.
- No. 17. Diseases and Enemies of Poultry, 128 pages, 1896.
- No. 18.* Digest of the General and Special Road Law for Pennsylvania, 130 pages, 1896.
- No. 19. Tabulated Analyses of Commercial Fertilizers, 40 pages, 1896.
- No. 20. Preliminary Report of Secretary, 126 pages, 1896.
- No. 21. The Township High School, 24 pages, 1897.
- No. 22. Cider Vinegar of Pennsylvania, 28 pages, 1897.
- No. 23.* Tabulated Analyses of Commercial Fertilizers, 31 pages, 1897.
- No. 24.* Pure Food and Dairy Laws of Pennsylvania, 19 pages, 1897.
- No. 25.* Farmers' Institutes in Pennsylvania, 8 pages, 1897.
- No. 26. Farmers' Institutes in Pennsylvania, 74 pages, 1897.
- No. 27. The Culture of American Ginseng, 23 pages, 1897.
- No. 28. The Fungous Foes of the Farmer, 19 pages, 1897.
- No. 29. Investigations in the Bark of the Tree, 17 pages, 1897.

*Note.—Edition exhausted.

- No. 30. Sex in Plants, 17 pages, 1897.
- No. 31. The Economic Side of the Mole, 42 pages, 1898.
- No. 32.* Pure Food and Dairy Laws, 30 pages, 1898.
- No. 33.* Tabulated Analyses of Commercial Fertilizers, 42 pages, 1898.
- No. 34.* Preliminary Report of the Secretary, 150 pages, 1898.
- No. 35. Veterinary Medicines, 23 pages, 1898.
- No. 36. Constitutions and By-Laws, 72 pages, 1898.
- No. 37. Tabulated Analyses of Commercial Fertilizers, 40 pages, 1898.
- No. 38. Farmers' Institutes in Pennsylvania, 8 pages, 1898.
- No. 39. Farmers' Institutes in Pennsylvania, 88 pages, 1898.
- No. 40. Questions and Answers, 206 pages, 1898.
- No. 41. Preliminary Reports of the Department, 189 pages, 1899.
- No. 42. List of Creameries in Pennsylvania, 88 pages, 1899.
- No. 43.* The San José Scale and other Insects, 22 pages, 1899.
- No. 44. Tabulated Analyses of Commercial Fertilizers, 62 pages, 1899.
- No. 45. Some Harmless Household Insects, 13 pages, 1899.
- No. 46. Some Insects Injurious to Wheat, 24 pages, 1899.
- No. 47. Some Insects Attacking Fruit, etc., 19 pages, 1899.
- No. 48. Common Cabbage Insects, 14 pages, 1899.
- No. 49. Method of Protecting Crops, etc., 20 pages, 1899.
- No. 50. Pure Food and Dairy Laws of Pennsylvania, 33 pages, 1899.
- No. 51. Tabulated Analyses of Commercial Fertilizers, 69 pages, 1899.
- No. 52. Proceedings Spring Meeting of Board of Agriculture, 296 pages, 1899.
- No. 53. Farmers' Institutes in Pennsylvania, 1899-1900, 94 pages, 1899.
- No. 54. Tabulated Analyses of Commercial Fertilizers, 163 pages, 1899.
- No. 55. The Composition and Use of Fertilizers, 126 pages, 1899.
- No. 56. Nursery Fumigation and the Construction and Management of the Fumigating House, 24 pages, 1899.
- No. 57. The Application of Acetylene Illumination to Country Homes, 85 pages, 1899.
- No. 58. The Chemical Study of the Apple and Its Products, 44 pages, 1899.
- No. 59. Fungous Foes of Vegetable Fruits, 39 pages, 1899.
- No. 60. List of Creameries in Pennsylvania, 33 pages, 1899.

* Note.—Edition exhausted.

THE PENNSYLVANIA STATE AGRICULTURAL SOCIETY.

OFFICERS AND COMMITTEES FOR 1900.

PRESIDENT.

Hiram Young, York.

FIRST VICE PRESIDENT.

C. H. Bergner, Harrisburg.

VICE PRESIDENTS.

1. George A. Vare, Philadelphia.
2. William H. Wanamaker, Philadelphia.
3. Benjamin S. Kunkle, Philadelphia.
4. Charles E. Voorhees, Philadelphia.
5. A. J. Cassatt, Philadelphia.
6. David Y. Wilson, Gum Tree.
7. Robert E. Pattison, Philadelphia.
8. William T. Hildrup, Analomink.
9. George D. Stitzel, Reading.
10. Amos H. Mylin, Lancaster.
11. A. P. Young, Millville.
12. H. H. Colvin, Dalton.
13. A. D. Hay, Pottsville.
14. C. H. Bergner, Harrisburg.
15. Louis Piolet, Wysox.
16. Joel A. Herr, Cedar Springs.
17. Samuel Berkinbine, Northumberland.
18. Henry C. Chisholm, Huntingdon.
19. N. B. Critchfield, Critchfield.
20. Joseph Speer, Pittsburg.
21. J. D. Kirkpatrick, North Liberty.
22. J. C. Thornton, Fairview.
23. William Powell, Springboro.
24. Harry Hayward, State College.

AT LARGE.

William A. Stone, Harrisburg.
John Hamilton, State College.

ADDITIONAL MEMBERS EXECUTIVE COMMITTEE.

Levi G. McCauley, West Chester.
 S. B. Rutherford, Harrisburg.
 M. W. McAlarney, Harrisburg.
 S. F. Barber, Harrisburg.
 J. P. Nissley, Hummelstown.

CORRESPONDING AND RECORDING SECRETARY.

Henry C. Demming, Harrisburg.

TREASURER.

W. F. Rutherford, Harrisburg.

CHEMIST AND GEOLOGIST.

Hugh Hamilton, Harrisburg.

LIBRARIAN.

William H. Egle, Harrisburg.

STENOGRAPHER.

G. E. Crownshield, Harrisburg.

COMMITTEE OF ARRANGEMENTS.

Hiram Young, York.
 H. C. Demming, Harrisburg.
 D. Y. Wilson, Gum Tree.
 W. F. Rutherford, Harrisburg.
 Harry Hayward, State College.

COMMITTEE ON LEGISLATION.

Daniel H. Hastings, Bellefonte.
 Robert E. Pattison, Philadelphia.
 Joseph C. Sibley, Franklin.
 Levi G. McCauley, West Chester.
 Edgar C. Gerwig, Allegheny.

COMMITTEE ON FINANCE.

W. F. Rutherford, Harrisburg.
 Thomas J. Stewart, Harrisburg.
 John Curwen, M. D., Warren.

COMMITTEE ON LOCATION.

Hiram Young, York.
 B. J. McGrann, Lancaster.
 C. H. Bergner, Harrisburg.
 Louis Piollet, Wysox.
 H. C. Demming, Harrisburg.

COMMITTEE ON PRINTING.

J. P. Nissley, Hummelstown.
 John D. Kirkpatrick, North Liberty.
 Isaac Hinckley, Philadelphia.

ACT TO INCORPORATE THE PENNSYLVANIA STATE AGRICULTURAL SOCIETY.

Through the efforts of a number of prominent men of Pennsylvania in the year 1851, the following statute was passed by the law-making power of the State:

An Act to incorporate the Pennsylvania State Agricultural Society.

Section 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same, That* George W. Woodward, James Irvin, E. A. Thompson, Frederick Watts, T. J. Bingham and others, who have subscribed the constitution lately adopted by a convention assembled at Harrisburg, to improve the condition of agriculture, horticulture and the household arts, be and they are hereby created a body politic and corporate in law, by the name of "The Pennsylvania State Agricultural Society," and by that name shall have perpetual succession, and have capacity to sue and to be sued, and may have a common seal, which at their pleasure may alter or renew; they may take by gift, grant, devise, bequest or otherwise, lands and tenements, goods and chattels, necessary for all the purposes for which the society was instituted: *Provided*, The annual income therefrom shall not exceed ten thousand dollars, independent of annual contributions by members, and the same to convey, lay out, apply and dispose of, for the benefit of the said society, as they under their charter and by-laws may direct.

Section 2. That the members of the said corporation shall have power to make and enforce such constitution and by-laws as may be necessary for the good government of the society, and the same from time to time to revoke, alter and amend, as they may think proper: *Provided*, That the same shall not be inconsistent with the Constitution and laws of this State.

Section 3. That the sum of two thousand dollars, out of any money in the treasury not otherwise appropriated, be and the same is hereby appropriated to the said society; and annually hereafter a sum of equal amount to that paid by the members thereof into its treasury, affidavit of which fact, and the amount so raised by the treasurer of the society, being first filed with the State Treasurer: *Provided*, Such sum shall not exceed two thousand dollars in any one year,

Section 4. That when any number of individuals shall organize themselves into an agricultural or horticultural society, or any agricultural or horticultural society now organized within any of the counties of this Commonwealth shall have adopted a constitution and by-laws for their government, elected their officers, and raised annually, by the voluntary contributions of its members, any sum of money, which shall have been actually paid into their treasury, for the purpose of being disbursed for the promotion of agricultural knowledge and improvement, and that fact be attested by the affidavit of their president and treasurer, filed with the commissioner of the county, the said society shall be entitled to receive annually a like sum from the treasurer of their said county: *Provided*, That said annual payment out of the county funds shall not exceed one hundred dollars: *Provided further*, That but one such society in any county shall be entitled to receive such appropriation in any one year, under this act.

Section 5. That the president of the Pennsylvania State Agricultural Society, who shall receive or expend any of the moneys hereby appropriated, shall annually, on the first Monday of January, transmit to the Governor of the Commonwealth a detailed account of the expenditures of all the moneys which shall come into his hands under this act, and stating to whom and for what purpose paid; and a copy of the said report shall be transmitted to the legislature at as early a day as practicable, and the original shall be filed in the office of the Secretary of the Commonwealth. And the presidents of the several county agricultural societies shall annually transmit, in the month of December, to the executive committee of the Pennsylvania State Agricultural Society, all such reports or returns as they are required to demand and receive from applicants for premiums, together with an abstract of their proceedings during the year. This act shall at all times be within the power of the Legislature to modify, alter or repeal the same.

JOHN CESSNA,

Speaker of the House of Representatives.

BENJAMIN MATTHIAS,

Speaker of the Senate.

Approved—The twenty-ninth day of March, Anno Domini one thousand eight hundred and fifty-one.

WM. F. JOHNSON.

CONSTITUTION AND BY-LAWS OF THE PENNSYLVANIA STATE AGRICULTURAL SOCIETY.

Subsequently a constitution and by-laws were adopted by the Society, and from time to time amended until they are as follows:

NAME AND OBJECTS.

The name of the society shall be The Pennsylvania State Agricultural Society. The objects of this society are to foster and improve agriculture, horticulture, and the domestic and household arts.

WHO ARE MEMBERS.

Section 1. The society shall consist of all such persons as shall pay to the treasurer not less than two dollars, and annually thereafter, not less than two dollars; and, also, of honorary and corresponding members, the names of the members to be recorded by the secretary.

The officers of the county agricultural societies in this State, or delegations therefrom, shall be members ex-officio of this society.

The payment of twenty-five dollars shall constitute life membership, and exempt the members so contributing from all annual payments.

OFFICERS.

Section 2. The officers of this society shall be president, vice president from each congressional district, three-fourths of whom shall be practical agriculturists or horticulturists, a treasurer, a corresponding secretary, a recording secretary, a librarian, an agricultural chemist and geologist, and such assistants as the society may find essential to the transaction of its business; an executive committee, consisting of the above-named officers, five additional members, with the ex-presidents of the society, all of whom shall be elected at the annual meeting in January by the qualified members of the society.

OF THE PRESIDENT.

Section 3. The president shall have a general superintendence of all the affairs of the society.

FIRST VICE PRESIDENT.

That at the annual election of this society there shall be elected from one of the number of vice presidents one of said officers to act

as first vice president, whose duty it shall be to act as president in case of absence or the death of the president.

EX-PRESIDENTS.

That whenever the number of ex-presidents exceeds five (5), the name receiving the lowest number of votes shall be the one dropped from the list of officers.

OF THE VICE PRESIDENTS.

It shall be the duty of the vice presidents to take charge of the affairs of the association in their several districts; to advance all its objects; to call upon farmers to report as to the condition of agriculture in their neighborhood; to ask for information as to the modes of cultivation adopted by different farmers; and, as far as in their power, to make known the resources of their districts, the nature of its soil, its geological character, and all such matter as may interest farmers in every part of the State.

TREASURER.

The treasurer shall keep an account of all moneys paid into his hands, and shall pay bills when audited and approved by the executive committee. Each order for payment must be signed by the president or chairman of the executive committee.

CORRESPONDING SECRETARY.

The duty of this officer shall be to invite a correspondence with all persons interested in agriculture, whether in the State of Pennsylvania or elsewhere, but especially with our consuls in foreign countries, that new seeds, vegetables, or live stock may be introduced, and their fitness for cultivation and propagation in our climate be tested. At each stated meeting of the society, he shall read his correspondence, which shall, either the whole, or such parts as may be selected by the society, form a portion of the transactions. He shall also correspond with the president or other officers of each state society in the United States, at least twice in the year, for the purpose of combined and mutual action, and to be informed of the results and progress of each other's efforts; also, to invite mechanics to forward models or implements for examination or trial.

RECORDING SECRETARY.

The recording secretary shall keep the minutes of the society and of the executive committee. At the close of each year he shall prepare for publication such parts of the minutes and transactions of the society as may be designated.

The recording secretary shall have power to approve of such bills and contracts as he is authorized to make, and the treasurer shall pay the same.

LIBRARIAN.

The librarian shall take charge of all books, pamphlets, etc., belonging to the society, and shall act as curator to preserve seeds, implements, or whatever property the society may possess.

In case of the death of any of the officers of this society, the president shall have power to fill the vacancy by appointment until the next annual meeting of the society.

EXECUTIVE COMMITTEE AND QUORUM.

The executive committee shall transact the business of the society generally; shall superintend and direct the publication of such of the reports and transactions as they may deem proper, and shall designate the time and places for annual exhibitions, regulate the expenditures, examine all accounts, and keep such general charge of the affairs of the society as may best promote its interests.

They shall select their own chairman, and meet quarterly, and at any other time when convened by the president; five members shall form a quorum.

They shall call special meetings of the society when necessary.

ANNUAL MEETING OF THE SOCIETY AND QUORUM.

Section 4. The society shall meet annually, on the third Wednesday of January, at Harrisburg, when all the officers of the society, not otherwise appointed, shall be elected by ballot for the ensuing year, and until another election. The polls shall be opened at 10 A. M. and closed at 12 o'clock M., when the result of the election shall be announced. They shall also hold a general meeting at the time of the annual exhibitions, and special meetings whenever convoked by the executive committee.

Fifteen members shall form a quorum for the transaction of business, but no member in arrears shall be entitled to the privileges of the society.

QUALIFICATIONS OF VOTERS.

Section 5. No annual member hereafter shall be entitled to vote for the election of officers of the Pennsylvania State Agricultural Society unless he shall have been a member of the previous State fair, and in default of a State fair, then three months' previous membership shall be necessary.

Section 6. No one shall be eligible to office hereafter who has not obtained a right to vote under section five.

ALTERATIONS.

Section 7. This constitution may be altered or amended at the annual meetings in January by a vote of two-thirds of the members in attendance.

All amendments to the constitution, to be voted upon at the annual meeting of the society in January, must be submitted to the meeting of the executive committee in September preceding said annual meeting.

As will be noted by the foregoing act of Assembly, constitution and by-laws, the Pennsylvania State Agricultural Society is not a stock company, and has no stockholders. Any person, on the payment of \$2, is an annual member, and any person paying \$25 at one time, immediately becomes a life member.

During the 49 years of its existence, the State Society has held annual fairs in every one of the most populous counties of the Commonwealth, the last fair being at Lancaster the second week in October, A. D. 1899. Nearly \$1,000,000 have been paid in premiums; and the cost of buildings erected at various points in the State where the society has held exhibitions, and which were left for the benefit of local agricultural societies, exceeds \$200,000.

In addition, in the most prosperous days of the society it contributed \$14,000 to the Pennsylvania State Agricultural College, \$1,000 to the United States Centennial Exhibition in Philadelphia in 1876, and expended toward the International Sheep and Wool Exhibition in Philadelphia in 1880 over \$12,500. The Society lost very heavily holding fairs several years in succession in Philadelphia, and on leaving that city had an indebtedness of nearly \$100,000. But at the present time all claims, excepting one small one, has been adjusted, with sufficient money in the treasury, and pledges by friends, to hold an old-fashioned, first-class fair at Lancaster in September, A. D. 1900.

PENNSYLVANIA STATE BOARD OF AGRICULTURE.

MEMBERS FOR THE YEAR 1899.

MEMBERS EX-OFFICIO.

HON. WM. A. STONE, Governor.
 GEN'L J. W. LATTA, Secretary of Internal Affairs.
 DR. N. C. SCHAEFFER, Superintendent of Public Instruction.
 Hon. LEVI G. McCAULEY, Auditor General.
 DR. G. W. ATHERTON, President of the State College.
 PROF. JOHN HAMILTON, Secretary of Agriculture.

APPOINTED BY THE GOVERNOR.

Hon. L. Rhone, Centre Hall, Centre county,Term expires 1900.
 Hon. S. R. Downing, Goshenville, Chester county,Term expires 1901.
 Hon. H. A. Gripp, Tyrone, Blair county,Term expires 1902.

APPOINTED BY THE STATE POULTRY ASSOCIATION.

Hon. Norris G. Temple, Pocopson, Pa.

ELECTED BY COUNTY AGRICULTURAL SOCIETIES.

			Term expires.
Adams,	A. I. Weldner,	Arendtsville,	1900
Allegheny,	J. S. Burns,	Clinton,	1900
Armstrong,	D. W. Lawson,	Dayton,	1902
Beaver,	T. A. Clifton,	McCleary,	1902
Bedford,	W. C. Lutz,	Bedford,	1902
Berks,	H. G. McGowan,	Geiger's Mills,	1901
Blair,	F. Jaekel,	Hollidaysburg,	1901
Bradford,	L. Piollet,	Wysox,	1901
Bucks,	C. S. Balderston,	Lahaska,	1902
Butler,	W. H. H. Riddle,	Butler,	1902
Cambria,	J. J. Thomas,	Carrolltown,	1900
Cameron,	J. K. Hockley,	Emporium,	1900
Centre,	J. A. Woodward,	Howard,	1900
Chester,	Dr. J. P. Edge,	Downingtown,	1900
Clarion,	W. P. Henry,	Piollet,	1901
Clearfield,	J. Blair Reed,	Clearfield,	1901
Clinton,	J. A. Herr,	Cedar Springs,	1902
Columbia,	H. V. White,	Bloomsburg,	1900
Crawford,	W. W. Oliver,	Conneautville,	1901

Term expires.

Cumberland,	C. H. Mullin,	Mt. Holly Springs, ...	1900
Dauphin,	S. F. Barber,	Harrisburg,	1900
Delaware,	G. E. Heyburn,	Chadd's Ford,	1901
Erie,	A. L. Wales,	Corry,	1901
Fayette,	J. M. Hantz,	Merrittstown,	1902
Forest,	C. A. Randall,	Tionesta,	1901
Franklin,	C. B. Hege,	Marion,	1902
Fulton,	W. C. Patterson,	Webster's Mills,	1901
Greene,			
Huntingdon,	G. G. Hutchison,	Warriors' Mark,	1900
Indiana,	S. M. McHenry,	Indiana,	1901
Jefferson,	J. McCracken, Jr.,	Brookville,	1902
Juniata,	M. Rodgers,	Mexico,	1900
Lackawanna,			
Lancaster,	W. H. Brosius,	Fernglenn,	1901
Lawrence,	J. B. Johnston,	New Wilmington,	1900
Lebanon,	H. C. Snively,	Lebanon,	1901
Lehigh,	Dr. J. P. Barnes,	Allentown,	1901
Luzerne,	John T. Phillips,	Dallas,	1902
Lycoming,	A. J. Kahler,	Hughesville,	1900
McKean,	F. L. Sherburne,	East Smethport,	1900
Mercer,	John T. Crill,	Mercer,	1902
Mifflin,	D. E. Notestine,	Lewistown,	1901
Monroe,	R. F. Schwarz,	Analomink,	1902
Montgomery,	J. Sexton,	Spring House,	1902
Montour,	J. K. Murray,	Pottsgrove,	1901
Northampton,	B. B. McClure,	Bath,	1900
Northumberland,			
Perry,	J. E. Stephens,	Acker,	1901
Philadelphia,	E. Lonsdale,	Chestnut Hill,	1901
Potter,	W. A. Gardner,	Andrews' Settlement, ..	1900
Schuylkill,	W. H. Stout,	Pine Grove,	1900
Snyder,	J. F. Boyer,	Mt. Pleasant Mills, ...	1900
Somerset,	N. B. Critchfield,	Critchfield,	1901
Sullivan,	J. W. Rodgers,	Forksville,	1900
Susquehanna,	C. W. Brodhead,	Montrose,	1901
Tioga,	F. E. Field,	Balsam,	1902
Union,	J. Newton Glover,	Vicksburg,	1902
Venango,	Porter Phipps,	Kennerdell,	1901
Warren,	R. J. Weld,	Sugar Grove,	1901
Washington,	J. McDowell,	Washington,	1902
Wayne,	W. C. Norton,	Aldenville,	1901
Westmoreland,	M. N. Clark,	Claridge,	1901
Wyoming,			
York,	S. B. Helges,	York,	1901

OFFICIAL LIST.

PRESIDENT.

Hon. William A. Stone, Governor.

VICE PRESIDENTS.

Jason Sexton,
S. F. Barber.

S. B. Heiges,

EXECUTIVE COMMITTEE.

Hon. Wm. A. Stone,
Joel A. Herr,
Will B. Powell,
G. G. Hutchison,
L. Piollet,

J. S. Burns,
M. Rodgers,
W. H. Stout,
Prof. John Hamilton, Secretary.

ADVISORY COMMITTEE.

L. Piollet,
W. H. Stout,

J. A. Herr,
Prof. John Hamilton, Secretary.

SECRETARY.

Prof. John Hamilton, Harrisburg.

BOTANIST.

Thomas Meehan, Germantown.

POMOLOGIST.

Cyrus T. Fox, Reading.

CHEMIST.

Dr. Wm. Frear, State College.

VETERINARY SURGEON.

Dr. Leonard Pearson, Philadelphia.

SANITARIAN.

Dr. G. G. Groff, Lewisburg.

MICROSCOPISTS AND HYGIENISTS.

Dr. H. Leffman, Philadelphia.

Prof. C. B. Cochran, West Chester.

ENTOMOLOGISTS.**Prof. R. C. Scheidt, Lancaster.****Dr. H. Skinner, Philadelphia.****ORNITHOLOGIST.****Dr. H. T. Fernald, State College, Pa.****METEOROLOGISTS.****E. R. Demain, Harrisburg.****J. L. Heacock, Quakertown.****MINERALOGIST.****Prof. Joseph Wilcox, Philadelphia.****APIARIST.****Dr. G. G. Groff, Lewisburg.****GEOLOGIST.****Prof. Isaac A. Harvey, Beech Creek.**

STANDING COMMITTEES.

LEGISLATION.

Jason Sexton, Chairman.

W. C. Norton,

L. Piollet,

J. K. Murray,

G. G. Hutchison.

CEREALS AND CEREAL CROPS.

B. B. McClure, Chairman.

ROADS AND ROAD LAWS.

S. R. Downing, Chairman.

FRUIT AND FRUIT CULTURE.

W. H. Stout, Chairman.

DAIRY AND FOOD PRODUCTS.

S. F. Barber, Chairman.

FERTILIZERS.

Matthew Rodgers, Chairman.

WOOL AND TEXTILE FIBERS.

John McDowell, Chairman.

LIVE STOCK.

J. S. Burns, Chairman.

POULTRY.

C. W. Brodhead, Chairman.

FORESTS AND FORESTRY.

W. C. Norton, Chairman.

APIARY.

N. B. Critchfield, Chairman.

AN ACT ESTABLISHING THE STATE BOARD OF AGRICULTURE.

AN ACT

To Establish a State Board of Agriculture.

Section 1. *Be it enacted, etc.*, That the Governor of the Commonwealth, the Secretary of Internal Affairs, the Superintendent of Public Instruction, the Auditor General, the President of the Pennsylvania State College, and one person appointed from or by each agricultural society in the State, entitled under existing laws to receive an annual bounty from the county, and three other persons appointed by the Governor, with the consent of the Senate, shall constitute the State Board of Agriculture.*

Section 2. One-third of the members appointed shall retire from office on the fourth Wednesday in January in each year, according to their several appointments. The vacancies thus occurring, shall be filled in the same manner as above provided, and the persons thus appointed shall hold their office for three years from the expiration of the former term. Other vacancies may be filled in the same manner, for the remainder of the vacant term.

Section 3. The board shall meet at the capital of the State, at least once in each year, and as much oftener as may be deemed expedient. No member of said board shall receive compensation from the State, except for necessary personal expenses, when engaged in duties of the board.

Section 4. They shall appoint, and prescribe the duties of a secretary of the board, who may receive a salary, not exceeding fifteen hundred dollars a year.

* Note.—Extracts from the Law.

"That when any number of individuals shall organize themselves into an agricultural or horticultural society, or any agricultural or horticultural society now organized within any of the counties of this Commonwealth, shall have adopted a constitution and by-laws for their government, elected their officers, and raised annually, by the voluntary contributions of its members any sum of money which shall have been actually paid into their treasury, for the purpose of being disbursed for the promotion of agricultural knowledge and improvement, and that fact be attested by the affidavit of their president and treasurer, filed with the commissioners of the county, the said county society shall be entitled to receive annually a like sum from the treasurer of their said county: *Provided*, That said annual payment out of the county funds shall not exceed one hundred dollars: *Provided further*, That but one such society in any county, shall be entitled to receive such appropriation in any one year, under this act."—Section 4, Act No. 203, 1851.

"That there shall be but one member of the Board from any county in the State. That any county asking for representation in the Board must have an agricultural society which shall raise a sum of money each and every year, for the advancement of agriculture, so as to be entitled to an annual bounty on the conditions prescribed in the acts of 1851 and 1876."—From Rules of the Board.

Section 5. They shall investigate such subjects, relating to improvements in agriculture in the State, as they may find proper, and take, hold in trust, and exercise control over donations or bequests made to them for the promotion of agriculture and general interest of husbandry.

Section 6. They may prescribe forms for, and regulate returns from local agricultural societies, and furnish to the officers of each such blanks as they deem necessary to secure uniform and reliable statistics.

Section 7. They shall annually, on or before the fourth day of January in each year, by their president or secretary, submit to the General Assembly, a detailed report of their doings, with such recommendations and suggestions as the interests of agriculture may require.

Section 8. The secretary of the board shall, in each year, cause to be made and published, for distribution, as full an abstract of the returns from local societies as the board may deem useful.

Section 9. The secretary shall have a permanent office at the capital, under the control and supervision of the board, which shall be supplied and maintained at the expense of the State.

This act shall take effect on the fourth Wednesday of January next ensuing.

Approved—The 8th day of May, A. D. 1876.

JOHN F. HARTRANFT.

**CERTIFICATE OF ELECTION TO MEMBERSHIP IN THE STATE
BOARD OF AGRICULTURE.**

..... 190..

Office of the Agricultural Society.
..... County, Pa.

This will Certify, That
of County of was this day
..... to represent this Society in the Pennsylvania State
Board of Agriculture, for the term of three years, commencing from
and on the fourth Wednesday of January, 190..; and that the said

Society was organized under, and has complied with the Acts of Assembly and rules of the Board of Agriculture, as above set forth.

(SEAL)

.....,
President.

P. O. Address,

Attest:

.....

Secretary.

P. O. Address,

MINUTES OF THE ANNUAL MEETING OF THE PENNSYLVANIA STATE BOARD OF AGRICULTURE.

HELD AT HARRISBURG, JANUARY 25 AND 26, 1899.

Wednesday Morning, January 25, 1899.

Board called to order at 10 A. M. by Vice President Jason Sexton, in the chair.

Present: Messrs. Critchfield, Thomas, White, McHenry, Powell, Weidner, Burns, Holderbaum, McGowan, Hockley, Barber, Hutchison, Rodgers (Juniata), Snavely, Kahler, Notestine, Murray, McClure, Stephens, Boyer. Rodgers (Sullivan), Brodhead, Norton, Clark, Heiges, Piolet and the Secretary.

The Secretary announced that, owing to the legal limitation of the term of membership, vacancies existed in the counties of Armstrong, Bucks, Beaver, Clinton, Crawford, Franklin, Greene, Jefferson, Lackawanna, Luzerne, Mercer, Monroe, Montgomery, Northumberland, Tioga, Union, Washington and Wyoming, and that these counties had not been called.

The Chair named Messrs. Hutchison, McClure and Heiges a committee to receive and report upon the credentials of members-elect and delegates.

On motion of Mr. Herr, a recess was taken to await the report of the committee on credentials.

The committee reported the following members-elect, as present, with proper credentials:

D. W. Lawson, of Armstrong; T. A. Clifton, of Beaver; C. A. Balder-

ston, of Bucks; W. H. H. Riddle, of Butler; J. A. Herr, of Clinton; C. B. Hege, of Franklin; J. M. Hantz, of Fayette; John T. Phillips, of Luzerne, and F. E. Fields, of Tioga.

They also reported that the following delegates were present with proper credentials: Juniata County Agricultural Society, Hon. W. Hertzler, D. G. Altar, and Hon. John McMeon.

Mt. Gretna Association, Dr. S. P. Heilman.

State Poultry Association, Norris G. Temple.

Perry County Agricultural Society, D. Kistler, John A. Bower, and F. A. Fry.

On motion, the Board then proceeded to the election of officers for the year 1899.

Messrs. Heiges, Piollet, Hutchison, Barker and Rodgers were nominated as Vice Presidents, and Messrs. Herr and Norton appointed tellers.

The tellers announced that Messrs. Sexton, Heiges and Barber had been elected Vice Presidents.

On motion, Messrs. Piollet, Powell and Hutchison were appointed a committee to inform the Governor that the Board was in session and would be glad to receive him as its President.

Messrs. Stout, Herr, Piollet, Powell, Hutchison, Kahler and Burns were nominated as members of the Executive Committee.

After a ballot, the tellers announced that Messrs. Herr, Powell, Piollet, Hutchison, Burns, Rodgers (Juniata), and Stout, had been elected as members of the Executive Committee.

Thos. J. Edge was elected as Secretary.

Minutes of previous meeting was read by Prof. John Hamilton, and adopted as read.

Adjourned to meet at 2 P. M.

Wednesday Afternoon, January 25, 1899.

Board called to order at 2 P. M. by Vice President Heiges in the chair.

The committee on credentials made a supplemental report to the effect that John McDowell, of Washington, had presented proper credentials and was entitled to membership in the Board.

On motion of Mr. McClure, Mr. Taylor, of Washington, was invited to a seat in the meeting, with the privilege of a member for this meeting.

W. H. Stout, of Schuylkill, read an essay on "Peach Culture," the subject matter of which called out considerable discussion from Messrs. Heiges, Stout, McClure, Snively, Kistler, the Secretary and others.

On motion, W. R. Lippencott, of the New Jersey Board of Agriculture, was admitted as a delegate from that State.

B. B. McClure, of Northampton, read an essay on "The Prospects for Eastern Farmers."

Dr. H. T. Fernald, Economic Zoologist, delivered an address, illustrated with specimens on some new insect foes.

Mr. Herr, of Clinton, offered the following, which was unanimously adopted: "Resolved, That this Board takes pleasure in testifying to the earnest, able and effective work of Dr. H. T. Fernald, the Economic Zoologist of the Department of Agriculture, realizing that his work has been an invaluable aid to the Pennsylvania farmer."

A recess was then taken for introduction to the Governor, who was brought into the meeting by the committee appointed for that purpose. The discussion of Dr. Fernald's address was then taken up and participated in by Messrs. Heilman, Dr. Fernald, McClure, Kistler, Hertzler and others.

O. W. Brodhead, of Susquehanna, delivered an address, which was fully illustrated by various patterns of shoes, on "Horse Shoeing," and was discussed by Messrs. Rothrock, Gardner, Thomas, Reeder, Hamilton, Dr. Conard, Hoover, Herr and others.

H. G. McGowan, of Berks, read an essay on "Dignifying your Calling as a Farmer."

On motion, adjourned until 7:30 P. M.

Wednesday Evening, January 25, 1899.

Board called to order at 7:30 P. M. by Vice President Heiges in the chair.

Prof. John Hamilton, Deputy Secretary of Agriculture, delivered an address on "How and Where Shall the American Farmer Find a Market?"

Hon. W. B. Powell delivered an extended illustrated address upon "Inventors and Inventions."

On motion, adjourned to meet Thursday, January 26, at 9 A. M.

Thursday Morning, January 26, 1899.

Board called to order at 9:15 A. M. by Vice President Heiges in the chair.

S. F. Barber, of Dauphin, delivered an address upon "The Preparation of Milk for Market," which called out discussion from Messrs. Phillips, Conard, Heiges, Barber, Hayward, Sexton, Stout, Herr, McClure, Snively, Powell and others.

Major Wells, Dairy and Food Commissioner of the Department of Agriculture, then addressed the Board upon "The Effect of Recent Decisions of the United States Supreme Court upon the Enforcement of the Pennsylvania Oleomargarine Law," which was discussed by Messrs. Gundy, Hayward, Comfort, Reeder, Phillips, Sexton, Sharpless, Wells, the Secretary and others.

H. V. White, of Columbia, read an essay upon "The Relation of the Farmer to the Markets of the State."

On motion of Mr. Herr, of Clinton, the question of the present status of the Board was taken up and discussed by the members generally.

On motion of Mr. Herr, it was resolved that a spring meeting be held. Mr. White named Bloomsburg and Prof. Heiges named York. After a vote, Bloomsburg was selected and May 31st fixed upon as the date of the meeting.

Dr. Leonard Pearson addressed the Board upon "The Present Status of the Struggle Against Tuberculosis," which called out discussion in which Messrs. Conard, Powell, McClure, Herr, Kistler, Hertzler, Phillips, Hutchison, Wells, Gundy, McGowan, Reeder and Pearson participated.

The executive committee announced that they had agreed upon the following appointments.

(See list).

They also reported that they had agreed upon the following Honorary Officers of the Board.

(See list).

On motion, adjourned to meet at Bloomsburg, May 31, 1899.

COMMONWEALTH OF PENNSYLVANIA.

STATE LIVE STOCK SANITARY BOARD.

PRESIDENT.

Hon. William A. Stone, *Governor.*

VICE PRESIDENT.

Hon. Jesse K. Cope, *Dairy and Food Commissioner.*

TREASURER.

Prof. John Hamilton, *Secretary of Agriculture.*

SECRETARY.

Dr. Leonard Pearson, *State Veterinarian.*

AN ACT ESTABLISHING THE STATE LIVE STOCK SANITARY
BOARD.

AN ACT

To establish the State Live Stock Sanitary Board of Pennsylvania, and to provide for the control and suppression of dangerous, contagious or infectious diseases of domestic animals.

Section 1. *Be it enacted, etc.,* That a Board is hereby established to be known as "The State Live Stock Sanitary Board." This Board shall consist of the Governor of the Commonwealth, the Secretary of Agriculture, the State Dairy and Food Commissioner and the State Veterinarian who shall be a competent and qualified person as provided in the act, entitled "An act to create a Department of Agriculture and define its duties."

Section 2. That it shall be the duty of the State Live Stock Sanitary Board to protect the health of the domestic animals of the State, to determine and employ the most efficient and practical means for the prevention, suppression, control or eradication of dangerous, contagious or infectious diseases among the domestic animals, and for these purposes it is hereby authorized and empowered to establish, maintain, enforce and regulate such quarantine and other measures relating to the movements and care of animals and their products, the disinfection of suspected localities and articles and the destruction of animals, as it may deem necessary, and to adopt from time to time all such regulations as may be necessary and proper for carrying out the purposes of this act: *Provided, however,* In the case of any slowly contagious diseases only suspected or diseased animals shall be quarantined.

Section 3. That when it shall be deemed necessary to condemn and kill any animal or animals to prevent the further spread of disease, and an agreement cannot be made with the owners for the value thereof, three appraisers shall be appointed, one by the owner, one by the commission or its authorized agent, and the third by the two so appointed, who shall, under oath or affirmation, appraise the animal or animals, taking into consideration their actual value and condition at the time of appraisement, and such appraised price shall be paid in the same manner as other expenses under this act are provided for: *Provided,* That under such appraisement not more than twenty-five dollars shall be paid for any infected animal of grade or common stock, and not more than fifty dollars for any infected animal of registered stock, nor more than forty dollars for any horse or mule of common or grade stock and not to exceed fifty per cent. of the appraised value of any standard bred, registered or imported horses.

Section 4. That the Board or any member thereof, or any of their duly authorized agents, shall at all times have the right to enter any premises, farms, fields, pens, abattoirs, slaughter houses, buildings, cars or vessels, where any domestic animal is at the time quartered, or wherever the carcass of one may be, for the purpose of examining it in any way that may be deemed necessary to determine whether they are or were the subjects of any contagious or infectious diseases.

Section 5. That any person or persons wilfully violating any of the provisions of this act or any regulation of the State Live Stock Sanitary Board, or wilfully interfering with officers appointed under this act, shall be deemed guilty of misdemeanor and shall upon conviction be punished by a fine not exceeding one hundred dollars or by imprisonment not exceeding one month, or both, at the discretion of the court.

Section 6. That the State Live Stock Sanitary Board is hereby empowered to appoint and employ such assistants and agents and to purchase such supplies and materials as may be necessary in carrying out the provisions of this act, and the Board and the members thereof are hereby empowered to administer oaths or affirmations to the appraisers appointed under this act, that they may order and conduct such examinations into the condition of the live stock of the State in relation to contagious diseases, including the milk supplies of cities, towns, boroughs and villages, as may seem necessary, and to take proper measures to protect such milk supplies from contamination.

Section 7. That all necessary expenses under the provisions of this act shall, after approval in writing by the Governor and the Secretary of Agriculture, be paid by the State Treasurer upon the warrant of the Auditor General in the manner now provided by law.

Section 8. That this act shall take effect June first, one thousand eight hundred and ninety-five, and all acts or parts of acts inconsistent herewith are hereby repealed.

Approved—May 21st, 1895.

AN ACT TO PROTECT THE HEALTH OF DOMESTIC ANIMALS.

AN ACT

To protect the health of the domestic animals of the Commonwealth of Pennsylvania.

Section 1. *Be it enacted &c.*, That the importation of dairy cows and neat cattle for breeding purposes into the Commonwealth of Pennsylvania is hereby prohibited, excepting when such cows and neat cattle are accompanied by a certificate from an inspector, whose competency and reliability are certified to by the authorities charged with the control of the diseases of domestic animals in the State from whence the cattle came, certifying that they have been examined and subjected to the tuberculin test and are free from disease.

Section 2. That in lieu of an inspection certificate as above required, the cattle may be detained at suitable stock-yards nearest to the State line on the railroad over which they are shipped, and there examined at the expense of the owner, or cattle as above

specified from points outside of the State may, under such restrictions as may be provided by the State Live Stock Sanitary Board, be shipped in quarantine to their destination in Pennsylvania, there to remain in quarantine until properly examined at the expense of the owner, and released by the State Live Stock Sanitary Board.

Section 3. The State Live Stock Sanitary Board is hereby authorized and empowered to prohibit the importation of domestic animals into the Commonwealth of Pennsylvania, whenever in their judgment such measures may be necessary for the proper protection of the health of the domestic animals of the Commonwealth, and to make and enforce rules and regulations governing such traffic as may from time to time be required.

Section 4. That any person, firm, or corporate body violating the provisions of this act, shall be deemed guilty of a misdemeanor, and upon conviction shall, in the proper court of the county in which such cattle are sold, offered for sale, delivered to a purchaser, or in which such cattle may be detained in transit, for each offense, forfeit and pay a fine of not less than fifty dollars or more than one hundred dollars, or be punished by imprisonment for not less than ten days, and not exceeding thirty days, either or both, at the discretion of court. Such person, firm or corporate body shall be liable for the full amount of the damages that may result from the violation of this act.

Section 5. The State Live Stock Sanitary Board is hereby charged with the enforcement of this act, and is authorized to see that its provisions are obeyed, and to make, from time to time, such rules and regulations as may be necessary and proper for its enforcement.

Section 6. That this act shall go into effect January first, one thousand eight hundred and ninety-eight.

Approved—May 26, 1897.

RULES FOR THE ENFORCEMENT OF THE ACT OF MAY 26, 1897,

Dairy cows and neat cattle for breeding purposes may be brought into Pennsylvania from other States only in accordance with one of the three following provisions:

1. The cattle may be examined and tested with tuberculin in the

State from whence they come by an inspector whose competency and reliability are certified to by the authorities charged with the control of the diseases of animals in that State. Special blanks for reporting upon such examinations will be furnished by the State Live Stock Sanitary Board upon application. Cattle thus examined, found to be free from disease and brought into Pennsylvania, shall remain in the possession of the person or persons who own them when brought into Pennsylvania until the inspection reports have been approved by a member of the State Live Stock Sanitary Board or by an agent authorized to approve such reports. After such approval the cattle can be disposed of without restriction.

2. Dairy cows and neat cattle for breeding purposes may, if shippers so elect, be examined and tested with tuberculin at suitable stock-yards nearest to the State line on the railroad over which they are shipped. Such examinations are to be made by inspectors approved by this Board and at the expense of the owner of the cattle.

Cattle so inspected shall be marked with a suitable metal tag or shall be accurately described so that they can be reliably identified, and a report on the examination and test, with directions for identification, shall be submitted without delay to this Board.

3. Dairy cows and neat cattle for breeding purposes may be brought into Pennsylvania without previous examination only under the following conditions:

A. Notification to the State Live Stock Sanitary Board that it is proposed to bring certain dairy cows or neat cattle for breeding purposes into this State. Such notice must be accompanied by the number and a full and accurate description of the cattle, the names and addresses of the owner and consignee, the date upon which they are to be brought into the State, the route over which they are to be driven or shipped, and the destination.

A blank form to use in rendering this report will be sent upon application to the State Live Stock Sanitary Board.

B. Such cattle shall remain in strict quarantine during transit and after they have arrived at their destination until they have been examined and tested with tuberculin by an inspector approved by this Board. Under this quarantine it is required that the cattle shall be kept apart from other cattle, that they shall remain in the possession of the person or persons who bring them into this State and that their milk shall not be sold or used without previous sterilization by boiling.

Dairy cows or neat cattle for breeding purposes brought into Pennsylvania under this provision that are found upon examination or test to be tuberculous, shall be strictly isolated and quarantined, their milk cannot be used for any purpose whatever without previous sterilization by boiling, and they shall not be moved to other premises

excepting for slaughter. No compensation shall be allowed for such cattle.

Approved by the State Live Stock Sanitary Board at Harrisburg, Pa., November 5, 1897.

LEONARD PEARSON,
Secretary.

EXTRACTS FROM THE RULES AND REGULATIONS OF THE
STATE LIVE STOCK SANITARY BOARD OF PENNSYLVANIA.

Upon application from owners of tuberculous cattle, the State Live Stock Sanitary Board will furnish tuberculin and inspections free, on condition that the cattle owner will agree to:

1. Assist in the examination.
 2. Separate the cattle found to be tuberculous from those that are healthy, and have them cared for separately until disposed of, as directed by the State Live Stock Sanitary Board.
 3. Disinfect the stables and correct faulty sanitary conditions, as directed by the State Live Stock Sanitary Board.
 4. Discontinue the use of milk and cream from infected cows, except when boiled or heated to 185 degrees F. and kept at this temperature for five minutes.
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Upon application from owners of dairy herds, the State Live Stock Sanitary Board will conduct or direct inspections of cattle and cattle stables and yards, and will furnish certificates showing the health of the animals and the sanitary condition of their surroundings: *Provided*, that the applicant will agree to bear the necessary expense of such inspections.

Since it is manifestly impossible for the State Live Stock Sanitary Board to investigate all rumors or unsubstantiated reports of contagious disease among domestic animals, the State Veterinarian may, if in his opinion there exists a reasonable doubt as to the dangerous,

contagious or infectious character of a reported disease, request the owners or person in charge of the stock, at his own expense, to have an examination made by a competent veterinarian, and furnish a report from such veterinarian to the Secretary of the Board. In case this request is not complied with, the Board may decline to consider the case. The following blank is furnished by the Board:

"To the State Live Stock Sanitary Board, Harrisburg, Pennsylvania:

"Gentlemen: I have had my entire herd inspected and tested with tuberculin and have reason to believe that some of my cattle are affected with tuberculosis.

"I have had this inspection and test made at my own expense and now wish to dispose of the diseased animals in accordance with the rules and regulations of the State Live Stock Sanitary Board and to avail myself of the assistance afforded by the Commonwealth in such cases. If such assistance is furnished, I agree to thereafter observe the precautions and measures and to employ the means recommended by your Board to prevent the reintroduction and redevelopment of tuberculosis in my herd.

"My herd includes the following animals: Cows, heifers over one year old, bulls over one year old, steers, calves under one year old; total The milk from this herd is used by for

The cattle are,

(State breed and whether registered.)

The inspection and test were made by of on 190 .

"I certify that, to the best of my knowledge and belief, none of the dairy cows or cattle for breeding purposes in my herd have been brought from another State into Pennsylvania since January 1, 1898, without having been subjected to inspection and tuberculin test, as required by law.

Yours respectfully,

.....
(Address).....

..... County, Pa."

The usual application form is the following:

"To the State Live Stock Sanitary Board, Harrisburg, Pennsylvania:

"Gentlemen: I have reason to believe that some of my cattle are afflicted with tuberculosis, and I wish to have my entire herd in-

spected, and tested with tuberculin, if such test is deemed necessary by your representative, and the diseased animals disposed of according to the rules and regulations of the State Live Stock Sanitary Board.

"I understand that this inspection and test are to be made at the expense of the Commonwealth and, in consideration thereof, I agree to thereafter observe the precautions and measures and to employ the means recommended by your Board to prevent the reintroduction and redevelopment of tuberculosis in my herd.

"I certify that, to the best of my knowledge and belief, none of the dairy cows or cattle for breeding purposes in my herd have been brought from another State into Pennsylvania since January 1, 1898, without having been subjected to inspection and tuberculin test, as required by law.

Yours respectfully,

.....
(Address)
..... County, Pa.

"My herd includes the following animals: Cows, heifers over one year old, bulls over one year old, steers, calves under one year old; total
The milk from this herd is used by for

"The cattle are
(State breed and whether registered.)

"The following are my reasons for believing that some of my cattle are afflicted with tuberculosis:

.....
.....
.....
.....
.....
.....
.....
.....
.....

PENNSYLVANIA LIVE STOCK BREEDERS' ASSOCIATION.

OFFICERS AND COMMITTEES.

PRESIDENT.

John I. Gordon,Mercer.

FIRST VICE PRESIDENT.

Henry Palmer,Avondale.

SECOND VICE PRESIDENT.

M. P. Shoemaker,Greensburg.

SECRETARY.

E. S. Bayard,Penn ave. & 8th st., Pittsb'g.

TREASURER.

J. F. Lantz,Altoona.

EXECUTIVE COMMITTEE.

W. T. Powell,Shadeland,Representing horses.
H. W. Comfort,Fallsington,Representing cattle.
Julius LeMoyne,Washington,Representing sheep.
Geo. W. Church,Waynesburg,Representing swine.
T. E. Orr,Penn av. & 8th st., P'b'g, .Representing poultry.

LEGISLATIVE COMMITTEE.

Mitchell Harrison, Chairman,400 Chestnut st., Philad'a.
Dr. H. P. Armsby,State College.
W. C. Norton,Aldenville.
W. H. Riddle, Secretary of Committee,Butler.
E. S. Bayard,Penn ave. & 8th st., Pittsb'g.
John I. Gordon, *ex-officio*,Mercer.

COMMITTEE ON FAIRS.

W. C. Black, Chairman,	Mercer.
James Blair,	Hartstown.
W. H. Rink,	Jennerstown.
W. M. Thompson,	Uniontown.
Thos. Sharpless,	West Chester.
Ezra Mitchener,	Carversville.
E. L. McSparran,	Lancaster.
J. I. Barley,	Baker's Summit.
J. L. Henderson,	Washington.
P. G. Walker,	Cecil.

COMMITTEE ON TRANSPORTATION.

Dr. Thomas Turnbull, Chairman,	Western ave., Allegheny.
Dr. W. L. McCleary,	Washington.
J. T. Armstrong,	Glenshaw.
Prof. John Hamilton,	Harrisburg.
W. A. McCoy,	Mercer.

THE PENNSYLVANIA HORTICULTURAL SOCIETY.

FOUNDED 1827.

OFFICERS AND COMMITTEES FOR THE YEAR 1900.

PRESIDENT.

James M. Rhodes.

VICE PRESIDENTS.

Robt. Craig,
Dr. Geo. Goebel,

Henry F. Michell,
Edwin Lonsdale.

TREASURER.

S. W. Keith.

SECRETARY.

David Rust.

PROFESSOR OF BOTANY.

Thomas Meehan.

PROFESSOR OF HORTICULTURAL CHEMISTRY.

Dr. Persifor Frazer.

PROFESSOR OF ENTOMOLOGY.

Rev. H. C. McCook, D. D.

EXECUTIVE COUNCIL.

John Wescott, Chairman.
Chester Davis,
J. Cheston Morris, M. D.,
Wm. K. Harris,

Moses Paxson,
Thomas Long,
John McCleary.

MEMBER OF THE STATE BOARD OF AGRICULTURE.

Edwin Lonsdale.

SECTIONS COMMITTEE.

J. Cheston Morris, M. D., Chairman,
Burnet Landreth,
Mrs. E. S. Starr,
Edwin Lonsdale.

Wm. F. Dreer,
Robert Craig,

FINANCE COMMITTEE.

Moses Paxson, Chairman,
Henry F. Michell,

C. Hartman Kuhn.

LIBRARY COMMITTEE.

Burnet Landreth, Chairman,
C. Hartman Kuhn,
J. D. Rand,

George C. Watson,
S. W. Keith.

COMMITTEE FOR ESTABLISHING PREMIUMS.

Edwin Lonsdale, Chairman,
W. Atlee Burpee,
John G. Gardner,
John Wescott.

Wm. K. Harris,
John McCleary,

PLANTS.

J. W. Coldesh, Chairman,
John Thatcher,
Geo. A. Strohleln,

Chester Davis,
Chas. Fox.

FLOWERS.

A. B. Cartledge, Chairman,
A. B. Scott,
S. S. Pennock,

C. Elsele,
H. B. Surman.

BASKETS, BOUQUETS AND DESIGNS.

J. Ewing Mears, M. D., Chairman,
Mrs. J. P. Lundy,
Mrs. C. C. Harrison,
Mrs. James M. Rhodes,
Mrs. Herbert Howe,
Mrs. Arthur H. Lea,
Mrs. Alex. Van Rensselaer,

Mrs. C. Stuart Paterson,
Miss Maria Blanchard,
Mrs. A. J. Cassatt,
Mrs. Chas. Wheeler,
Mrs. Geo. W. Childs Drexel,
Mrs. John C. Sims.

FRUITS.

John G. Gardner, Chairman,
John C. Lewis,

Wm. Warner Harper.

VEGETABLES.

W. Atlee Burpee, Chairman,
Wm. F. Dreer,
S. P. Landreth,

R. G. Carey,
J. Cheston Morris, M. D.

COMMITTEE TO ARRANGE FOR AND SUPERINTEND EXHIBITIONS.

Joseph Heacock, Chairman,
D. T. Connor,
Sidney W. Keith, •
David Bearn,
Geo. Campbell,
W. K. Harris,

C. Hartman Kuhn,
John Westcott,
Robert Craig,
H. H. Becker,
Wm. P. Craig.

COMMITTEE OF MUSIC AND PRINTING.

Burnet Landreth, Chairman,
David Rust,
Wm. F. Dreer.

W H. Ackley,

HOUSE COMMITTEE.

C. Hartman Kuhn, Chairman,
Wm. F. Dreer,

James M. Rhodes.

LIBRARIAN.

David Rust.

AUXILIARY COMMITTEES.

The President of the Society has appointed the following Committees of Ladies to assist the regular judges at the Annual Exhibition:

BASKETS, BOUQUETS AND DESIGNS.

Mrs. J. P. Lundy,
Mrs. C. C. Harrison,
Mrs. James M. Rhodes,
Mrs. Herbert Howe,
Mrs. Arthur H. Lea,
Mrs. Alex. Van Rensselaer,

Mrs. C. Stuart Paterson,
Miss Maria Blanchard,
Mrs. A. J. Cassatt,
Mrs. Chas. Wheeler,
Mrs. Geo. W. Childs Drexel,
Mrs. John C. Sims.

CUT FLOWERS.

Mrs. Alfred C. Harrison,
Mrs. Rodman Ellison,
Mrs. Jones Wister,
Mrs. Jno. W. Pepper,
Mrs. Jas. Logan Fisher,
Mrs. Percival Roberts, Jr.,
Mrs. Francis T. S. Darley,
Mrs. Chas. F. Berwind,

Mrs. Clement A. Griscom,
Mrs. Theo. Reath,
Mrs. Thomas McKean,
Mrs. Chas. Morton Smith,
Mrs. Wm. P. Henszey,
Mrs. Paul Thompson,
Mrs. Sidney Tyler,
Mrs. Geo. H. McFadden.

FRUITS AND VEGETABLES.

Mrs. B. P. Moulton,
Mrs. Walker,
Mrs. Theo. N. Ely,
Mrs. C. L. Borie, Jr.,
Mrs. Jos. F. Sinnott,
Mrs. Francis J. Ellison,

Mrs. John T. Lewis, Jr.,
Mrs. Alan Wood,
Mrs. Lincoln Godfrey,
Mrs. Rudolph Ellis,
Miss Garrett,
Miss Elizabeth Garrett.

RULES GOVERNING EXHIBITIONS.

1. Entries should be made with the Secretary at least one week before the opening, with full list of articles and statement of classes in which they are entered.
2. No exhibit can be staged until the exhibitor has furnished the Secretary with a full list of all the articles offered. This rule applies to articles "for exhibition only" as well as to exhibits entered for competition.
3. All exhibits must be correctly labeled on stiff cards of a uniform size. These cards will be furnished free by the Society on application to the Secretary.
4. All entries not made according to schedule will be disqualified.
5. When possible, exhibits should be delivered at the Exhibition Hall by 6 P. M. of the evening preceding the exhibition, and all exhibits must be in position by 12 noon on the day specified.
6. All plants shown in competition (except imported plants shown for the first time in the country and novelties) must have been in the possession of the exhibitor at least four months preceding the exhibition.
7. All entries must be staged by numbers only, the names of exhibitors to be attached after awards are made.
8. No competitor shall receive more than one premium in each class for which he competes.
9. The committee awarding premiums may award a certificate of merit or medal for meritorious exhibits in addition to the regular premiums of the Society.
10. No person shall be allowed to remain in the hall during the time the judges and their assistants are at work.
11. The amount of \$3.00 shall be deducted from all premiums awarded to persons not members of the Society.
12. No awards will be made to unworthy objects, even although they may be the only ones of their kind on exhibition.
13. Exhibits sent from a distance should be addressed to the Secretary, and express charges invariably prepaid.
14. No exhibit shall be removed until the close of the exhibition, except with the consent of the officers in charge.
15. No card larger than 9x12 inches shall be allowed on any exhibits, and all cards must be confined to the exhibitor's own exhibit.
16. Each person who becomes an exhibitor thereby agrees to conform strictly to the rules and regulations.

STATE HORTICULTURAL ASSOCIATION OF PENNSYLVANIA.

OFFICERS FOR 1898.

PRESIDENT.

S. B. Heiges, York.

FIRST VICE PRESIDENT.

Howard A. Chase, Philadelphia.

SECOND VICE PRESIDENT.

Calvin Cooper, Bird-in-Hand.

THIRD VICE PRESIDENT.

Gabriel Hiester, Harrisburg.

RECORDING SECRETARY.

Cyrus T. Fox, Reading.

CORRESPONDING SECRETARY.

William P. Brinton, Christiana.

TREASURER.

J. H. Bartram, Milltown.

PROGRAMME OF THE THIRTY-NINTH ANNUAL
MEETING OF THE STATE HORTICULTURAL
ASSOCIATION OF PENNSYLVANIA, HELD IN
EXCELSIOR HALL, LANCASTER, PA., JAN-
UARY 18 AND 19, 1898.

ORDER OF BUSINESS.

Tuesday, January 18, 1898, 10 A. M.

1. Opening Announcement.
2. Reading of Minutes of Previous Meeting.
3. Roll Call and Collection of Dues.
4. Election of Officers.
5. Reports of Officers.
6. Reports of Standing Committees.
7. Reports of Special Committees.
8. Address of Welcome.

Hon. E. S. Smeltz, Mayor of Lancaster.

9. Appointment of Committees.
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Tuesday Afternoon, January 18, 1898, 2 P. M.

10. Report of General Fruit Committee,
P. C. Hiller, Chairman, Conestoga, Pa.
11. Some Suggestions on Apple Culture,
Henry C. Snavely, Ex-President of the Association,
Lebanon, Pa.
12. Will Future Fruit Growing be Profitable?
E. C. Brinser, Middletown, Pa.
13. The Occasion for More Extensive Orchardng in Pennsylvania,
For General Discussion.
14. Question Box,

Tuesday Evening, January 18, 1898, 7.30 P. M.

15. Music.
 16. President's Annual Address.
Prof. S. B. Heiges, York, Pa.
 17. The Future of Plum Culture.
J. W. Kerr, Denton, Md.
 18. Music.
 19. Present Outlook in Pennsylvania in Reference to the San José
Scale,
Dr. George G. Groff, Bucknell University, Lewis-
burg, Pa.
 20. Music.
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Wednesday, January 19, 1898, 9.00 A.M.

21. Reports of Committees—Unfinished and New Business.
 22. A Waste of Money.
William H. Stout, Pine Grove, Pa.
 23. The Advantages of Spraying.
W. B. K. Johnson, Allentown, Pa.
 24. A Short Talk on Pruning.
Samuel E. Stauffer, Adamstown, Pa.
 25. Small Fruits—Best Old and New Varieties.
General Discussion.
 26. Question Box:
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Wednesday Afternoon, January 19, 1898, 1.30 P. M.

27. Reports of Committees.
28. Peach Culture in the Juniata Valley.
J. E. Jamison, Swales, Pa.
29. Some Observations on the Habits of the Peach Tree Borer.
Calvin Cooper, Bird-in-Hand, Pa.
30. Experience with Some of the Newer Roses and Carnations.
W. P. Brinton, Jr., Christiana, Pa.
31. Experience in Fruit Culture in 1897.
C. W. Good, Waynesboro, Pa.
32. The Advantages of Rural Life.
J. O. K. Roberts, Phoenixville, Pa.

MINUTES OF THE ANNUAL MEETING OF THE STATE HORTICULTURAL ASSOCIATION OF PENNSYLVANIA.

HELD AT LANCASTER, PA., JANUARY 18 AND 19, 1898.

Tuesday Morning, January 18, 1898.

The State Horticultural Association of Pennsylvania, convened in Excelsior Hall Lancaster, Pa., at 10 o'clock, it being the thirty-ninth annual meeting.

Prof. S. B. Heiges, of York, President of the Association, called the meeting to order. He expressed pleasure at the large attendance, and trusted the sessions would prove of profit to all the members. He stated that he had no preliminary remarks to make, other than to announce the deaths of Vice Presidents H. M. Engle, of Marietta, and Henry S. Rupp, of Shiremanstown, John C. Linville, of Gap, Ezra High, of Reading, for many years Chairman of the Committee on Entomology, and V. D. Barner, a prominent citizen of Allentown, who, although not a member of the Association, paid all the bills of the organization at its meeting in that city last year.

President Heiges stated that, with the exception of Mr. Barner, all the above mentioned were active and earnest members of the Association, and he thought it fit and proper that resolutions of condolence be drafted and sent to their respective families. A motion to the same effect prevailing, the chair appointed as a committee to execute the same, Calvin Cooper, of Bird-in-Hand, Chairman; H. C. Snavelly, of Lebanon, and E. C. Brinser, of Middletown.

Prof. Heiges also announced that Treasurer Bartram would be unable to be present, owing to the sudden demise of his sister, and he appointed Amos H. Yeager, of Greenland, to act.

THE MAYOR'S ADDRESS.

Secretary Fox then read the minutes of last year's meeting, at Allentown, which were approved, following which, Mayor Smeltz was introduced and bade the visitors a hearty welcome to the city's hospitality.

The Mayor's address was followed with the reading of Treasurer Bartram's report by the Secretary. There was a balance on hand from last year of \$69.04, and \$76 were received as dues, making the

total receipts \$145.04. The expenses were \$133.36, leaving a present balance on hand of \$11.68. The report was referred to an Auditing Committee, composed of Messrs. Brinser and Rakestraw.

The election of officers and reports and appointments of committees were postponed until to-morrow morning, when these matters will be made a special order of business.

On motion of Mr. Calvin Cooper, the Association adjourned, to meet at two o'clock.

Tuesday Afternoon, January 18, 1898.

REPORT OF THE GENERAL FRUIT COMMITTEE.

The first order of business this afternoon was the report of the General Fruit Committee, which was read by the Chairman, Mr. P. C. Hiller, of Conestoga, this county. It gave a general review, by counties, of all the fruit and vegetable crops of the past season in the State—their quality, amount of production, comparison with previous crops, and other germane topics.

After the reading of the report, the same was, on motion of Mr. Calvin Cooper, adopted, and the thanks of the Association were extended to the Committee's Chairman, Mr. P. C. Hiller, for the very exhaustive and comprehensive manner in which his work was discharged.

A PAPER ON APPLE CULTURE.

A paper on "My Experience in Apple Culture," by Mr. Henry C. Snively, Ex-President of the Association, of Lebanon, was the next feature of the programme.

The speaker treated the subject of soil cultivation and location in the raising and planting of trees in a practical way. Mr. Snively also favors spraying as a method of destroying insects, and stated that fungi are the cause of more fruit failures than insect depredations.

Quite a spirited discussion followed, the remarks principally bearing upon spraying. A number of members indicated their willingness to make a test this year on one tree of a mixture of three pounds of sulphate of copper to fifty gallons of water, which is considered a good spraying mixture.

Mr. Rogers, of New Jersey, stated that it might be interesting to know why the "Ben Davis" apple sells for a higher figure than other varieties. It is a good market apple, he said, because of its size and color, and on account of its uniformity of size it more nearly measures thirty-two quarts to the bushel than other varieties.

A PAPER ON FRUIT GROWING.

"Will Future Fruit Growing be Profitable?" was the subject of a valuable paper by Mr. E. C. Brinser, of Middletown, Pa. The question

depends almost entirely upon circumstances and conditions, the speaker contended, and it may be answered both in the affirmative and negative. Mr. Brinser spoke about the glamour centering in the reports of huge crops that resulted in a small mint to the raiser. Several instances were cited.

In the ensuing discussion, Mr. Cooper said that fruit growing has not been as profitable as it might have been to many people if they had used the proper means. Failures frequently result from inexperience and the planting of too many varieties, when better results would have been achieved by paying more studious attention to one kind.

Mr. William H. Moon, of Bucks county, spoke in a more enthusiastic vein and expressed confidence in the hope of greater profit to the grower in the future, especially in peaches and apples.

Remarks were made by a number of the members on "thinning out" the peaches, and the general concensus of opinion expressed was that of approval of the plan.

MORE EXTENSIVE ORCHARDING.

The final feature of the afternoon programme was a general discussion on "The Occasion for More Extensive Orcharding in Pennsylvania," which was suggested to the President by Prof. Geo. C. Butz, of the State College, who was unavoidably absent from the meeting. Opinion seemed to be divided as to whether it would be wiser to extend the orchard acreage or to pay more attention to the cultivation of trees already planted.

Mr. Snively, of Lebanon, pleaded urgently for more education in the planting of trees. Too much work is done at random. He was also a believer in the opinion that there are too many orchards in the State, and that it would be more beneficial if ten trees were to be cut down and replaced by three, that should receive more care and cultivation.

Mr. Horace Broomall, of Cheyney, Delaware county, stated that an orchard had not been planted in his vicinity since his grandfather's time.

JAPANESE PLUMS.

"The Value of Japanese Plums for Pennsylvania Markets" was next taken up for discussion. Remarks of value and interest were made on the topic by W. H. Stout, of Pine Grove, and Thomas Rakestraw, of Chester county.

Mr. W. P. Brinton, of Christiana, said that the Japanese plums bid fair to become a very important and valuable crop. The fruit is very luscious and is better liked than strawberries.

Mr. Ralph Ege, Ex-President of the New Jersey Association, said

he had discovered the secret of unprofitableness in apple raising. A number of his trees were actually dying of starvation, although the land was not poor, but needed different fertilizers and more cultivation. He then thinned out his orchard and cropped it with wheat and heavily fertilized it, with excellent results. Mr. Ege recommended bone and potash as fertilizers, applying a ton to the acre, and he advised care in cultivation that the roots be not broken. The speaker had had the above experience in apple and peach trees.

A motion to adjourn then prevailed.

Tuesday Evening, January 18, 1898.

The evening session was held in the Court House, and in view of the publicity given the meeting and the interesting character of the proceedings, the attendance was light, and the members were tardy in putting in an appearance. At eight o'clock Prof Heiges called the meeting to order, and introduced the North End Glee and Mandolin Club, who played a lively selection on their stringed instruments. James Snyder, a member of the club, followed with a song that was rendered with a hearty spirit to the mandolin club's accompaniment.

PRESIDENT'S ADDRESS.

President Heiges then delivered his annual address to the Association. He chose for his subject "A Reminiscent and Perspective View of Our Society." President Heiges commented upon the peculiar position in which he was placed as being the only presiding officer present, and he spoke feelingly upon the demise of the two Vice Presidents during the year.

THE SAN JOSE SCALE.

Dr. Geo. G. Groff, of Bucknell University, was introduced, and gave a valuable talk on the "Present Outlook in Pennsylvania in Reference to the San José Scale." A tour of the Commonwealth revealed the fact that the large nurseries are entirely free from the pest, but many of the smaller ones are afflicted. The speaker believed the matter should be thoroughly investigated. At the close of his able address Dr. Groff was asked many questions on the subject, which he satisfactorily answered.

The Association was then favored with an excellent solo by Mr. C. H. Burkholder, who sang the "Organ Grinder's Serenade" in splendid voice. He was followed with two vocal selections by G. Edw. Compton, which were also heartily enjoyed, and likewise a rendition by the mandolin club.

The Association adjourned until to-morrow morning.

Wednesday Morning, January 19, 1898.

There was a large attendance when President Heiges called the body to order shortly after nine o'clock this morning. The transaction of routine business was first on the programme.

The committee appointed to audit the treasurer's report stated that they found his accounts correct.

REPORT OF LEGISLATIVE COMMITTEE.

Secretary Fox, of the Legislation Committee, submitted a verbal report. He said that after last year's meeting, several members of the committee had a conference with Secretary of Agriculture Edge and Dr. Warren, the State Economic Zoologist, with a view to securing an amendment to the State agricultural laws, especially with a view to establishing an agricultural bureau. The committee was advised, however, not to press their desires, because it would entail an additional expense upon the State. They were informed that a bill would be presented providing for State aid in the extermination of peach yellows and the San José Scale and such a bill was passed at the last Legislature. The report was adopted.

PLUM CULTURE.

Mr. J. W. Kerr, of Denton, Md., was introduced and read an excellent paper on "The Future of Plum Culture," which was booked for Tuesday evening. In viewing this subject, he said, we can only see through a glass darkly. Twenty years ago, the only plums found in the American markets were the European varieties that were raised in western New York, and the aggregate production at that time was but half dozen car loads, whereas the country now raises hundreds of barrels. Great improvement is needed in the plum stalks.

Mr. Kerr has an orchard of over 7,000 plum trees, and in answer to a query by J. Horace Broomall, as to what native varieties he would recommend for planting, he replied that the "Charles Downing," the "Milton," "Whitaker," "Chickasaw," "Smiley" and "Wild Goose" are to be preferred. In answer to another question Mr. Kerr said that the Burbank Japan Plum was more obnoxious than all the pernicious tree agents in the country, and a self-respecting man would scarcely have a tree of the variety in his orchard. Growers who planted the Burbank near Smyrna, Del., have lost pecuniarily as a result. The speaker stated in the same connection that he would not recommend the "Lincoln," "Lombard" or "Willard" varieties.

WASTE OF MONEY.

Mr. William H. Stout, of Pine Grove, Pa., a member of the State Board of Agriculture, next addressed the meeting on the topic, "A

Waste of Money." His remarks were directed to the foolishness displayed by many farmers in purchasing needless trees from indefatigable agents with seductive tongues, which prove of no profit through lack of proper care. The farmers, the speaker declared, are wasting more money on trees than the Legislature did at its last session. In closing, Mr. Stout gave a few practical hints in planting apple trees.

"The Advantages of Spraying," was the theme upon which Mr. B. K. Johnson, of Allentown, Pa., addressed the meeting. This form of killing pests, he said, has been carried on in different forms for many years. Mr. Johnson was one of the pioneer sprayers in his own and adjoining counties. The advantages of spraying are threefold, and great advances have been made in the same in the past few years. The speaker strengthened his point by displaying the excellent results derived from spraying, as exhibited in charts from Cornell College.

A recess of five minutes was then taken to allow members to pay their dues, immediately after which officers for 1898 and 1899 were elected.

ELECTION OF OFFICERS.

Mr. Moon nominated Prof. Heiges for the Presidency, but the latter positively declined to accept. He had reached a time in life when inclement weather would prevent him from attending the meetings. He believed in young men for action and old men for counsel.

Mr. Chase and Mr. Calvin Cooper spoke briefly on the President's action, which they sincerely regretted, and both of them expressed the hope that he would reconsider his withdrawal. Secretary Fox quickly grasped the situation and put the question. Prof. Heiges was then nominated with a unanimous voice.

Mr. Howard A. Chase, of Philadelphia, received the nomination for First Vice President; Calvin Cooper, of Bird-in-Hand, for Second Vice President; Gabriel Hiester, of Harrisburg, for Third Vice President; Cyrus T. Fox, of Reading, for Recording Secretary; W. P. Brinton, of Christiana, for Corresponding Secretary, and J. Hibbard Bartram, of Milltown, Chester county, for Treasurer.

Messrs. H. C. Snavelly, Wm. H. Moon and H. A. Chase were appointed tellers and Daniel D. Herr was authorized to cast the ballot. The above nominees were declared elected unanimously.

WILL MEET IN HARRISBURG.

The place for holding the next meeting then occupied the Association's attention. Harrisburg and Norristown were nominated. A rising vote was taken, resulting in a choice of Harrisburg by a vote of 27 to 14.

PRUNING.

The next item on the programme was a talk on "Pruning," by Mr. Samuel E. Stauffer, of Adamstown, this county. Mr. Stauffer explained his manner of caring for the trees which he pruned, viz: Peaches, pears, plums, cherries and the strawberry. Mr. Chase advised such pruning as will insure a fair new growth every year. He prunes every day after the first of February, as soon as opportunity affords.

President Heiges temporarily vacated the chair and made a motion to the effect that the Secretary be requested to prepare a list of names of small fruits that have had at least one year's trial, and that at the next meeting the members shall vote upon the same for selection; the Secretary being further instructed to place a star opposite the names of those productive of the best results.

The motion elicited considerable discussion, some of the members being of the opinion that the discussions on the matter would consume too much of the Society's time, and, in view of the expressed opposition, Prof. Heiges withdrew his motion.

A motion to adjourn then prevailed.

Wednesday Afternoon, January 19, 1898.

President Heiges called the members to order promptly at half-past one o'clock, for the final session of the interesting and profitable convention. The reports of committees and the transaction of new business was the first item on the programme.

RESOLUTIONS.

A resolution by Dr. George G. Groff was read, providing that the legislative committee be instructed to use every means to obtain legislation to secure a member of the State Board of Agriculture who will care for the interests of horticulture.

Secretary of Agriculture Thomas J. Edge, of Harrisburg, whose presence in the convention at its last session was gratefully commented upon by Secretary Fox, moved to amend that the legislative committee endeavor to secure a distinct division in the Department of Agriculture devoted to Horticulture.

The resolution was unanimously adopted as amended.

On motion of Mr. W. P. Brinton, the title of the General Fruit Committee was changed to that of the General Horticultural Committee.

Mr. W. H. Brinton, of Atglen, addressed the convention on a new topic, viz: Of the excessive rates for freight transportation as charged by certain railroads, in which he claimed that the companies discriminate against fruit growers.

Mr. J. B. Rogers, of Newark, N. J., spoke on the same subject. He urged a unity in action in order to secure the best results, and closed his remarks by offering a resolution, that it be the sense of this Association that it act in unison with a committee of the Farmers' National Congress in securing a classification and uniformity of rates for the transportation of fruits. The resolution was adopted unanimously.

Mr. Calvin Cooper, of Bird-in-Hand, submitted the report of the Committee on Necrology. The members who died during the year were Henry M. Engle, of Lancaster; Henry S. Rutt, of Cumberland; Ezra High, of Berks; John C. Linville, of Lancaster, and V. D. Barner, of Lehigh.

The report contained a short biographical sketch of each of the above, and a resolution extending the Association's sincere sympathy to the families and friends of the deceased.

Secretary Fox then spoke feelingly and eloquently about the dead members, and paid a tribute to A. C. Sisson, of Lackawanna county, who died a little over a year ago.

The report was then adopted, and, at the President's suggestion, by a rising vote of respect.

President Heiges announced the following committees:

On arrangements for next year's meeting—Gabriel Hiester and T. A. Woods, of Harrisburg; J. L. Reiff, of West Fairview; John F. Rutt, of Shiremanstown, and Cyrus T. Fox, of Reading, Secretary of the Association, as chairman.

On general resolutions—Messrs. H. Chase, of Philadelphia; William H. Moon, of Morrisville; J. G. Engle, of Marietta; M. D. Kendig, of Creswell, Lancaster county, and Calvin Cooper of Bird-in-Hand, chairman.

Mr. Calvin Cooper then submitted the report of the committee on resolutions, which extended thanks to the commissioners of Lancaster county for the use of the Court House, to the local committee for the arrangements that were made for the meeting and to the local press for their full and accurate reports of the proceedings. The report was adopted.

The association then heard brief reports concerning small fruits—both old and new varieties and novelties, which were quite interesting.

PAPER ON THE PEACH TREE BORER.

A paper by Mr. Calvin Cooper, on "Some Observations on the Habits of the Peach Tree Borer," followed. The speaker entertains the belief that the borer is responsible for the peach yellows. He made a very thorough examination of the roots of his trees about the first of August last. The borers are usually found in the gum that

exudes from the bark, and their powers of locomotion are very poor. As a remedy the speaker has tried caustic soda with good results.

Mr. Samuel E. Stauffer, of Adamstown, said that Mr. Cooper is simply doing what he (Mr. Stauffer) practices. He makes very careful searches for the borers and kills them with the aid of wire.

Mr. T. A. Woods, of Harrisburg, used unslaked lime to kill the borers; which proved to be a most successful remedy.

Mr. W. P. Brinton, of Christiana, believes in piling up dirt around the base of the tree. The borer will then be compelled to dig into harder bark, and more eggs will perish.

Mr. Woods advocated wrapping the young trees in stout paper as a preventative.

OTHER PAPERS.

Mr. Morris Brinton, of Christiana, then spoke in a profitable way about his "Experience with Some of the Newer Roses and Carnations."

Secretary Fox read a brief paper from C. W. Good, of Waynesboro, Pa., on "Experience in Fruit Culture in 1897."

Mr. Frank Bartram, of Parry, New Jersey, followed with a paper on "Chestnut Culture."

The Secretary then read letters from President Stahr, extending an invitation to the members to visit Franklin and Marshall College; from Ex-Secretary of the Association E. D. Engle, of Waynesboro; from the United States Department of Agriculture, which stated that twenty copies of the farmers' bulletin on black rot of cabbage had been sent to the Association, and from O. D. Shock, Chief Clerk of the Pennsylvania Department of Agriculture.

Mr. Daniel D. Herr, of Lancaster, presented the report of the Committee on Nomenclature, giving a list of the exhibits. The report was unanimously adopted.

This concluded the regular discussion, and a number of minor topics were treated in an informal way.

On motion of Mr Chase, the Association was declared adjourned.

REPORT OF THE COMMITTEE ON NECROLOGY.

Whereas, It having pleased an All-wise Providence to remove from our midst during the last year six of our members, to-wit:

Henry M. Engle, of Lancaster county.

Henry S. Rupp, of Cumberland county.

Ezra High, of Berks county.

John C. Linville, of Lancaster county.

V. D. Barner, of Lehigh county.

Mr. Henry M. Engle has filled very creditably several very honorable positions as an officer of the Association, from the presidency to

those of the most active work on committees. He was one of the original organizers of the Society, 39 years ago. His untiring zeal in the promotion and advancement of horticultural knowledge was always uppermost, and his unselfish ambition to foster every measure that would enlarge and extend the usefulness of the Society, seemed to never relax, in his desire to do good for his friends and associates.

Henry S. Rupp was a zealous and ardent associate in our midst, untiring in his efforts in the advancement of horticulture, in the production of new fruits and flowers, as well as in floriculture; and his unselfish ambition to foster every measure that would enlarge and extend the usefulness of our Society.

Ezra High has for quite a season been active in his research for the advancement of entomology, which enter so largely in successful horticulture, that we miss in him a very valuable associate.

John C. Linville, although not an active or conspicuous man, in his quiet way and his inexhaustible knowledge in practice and scientific research, was possessed of very valuable information. In a social way he endeared himself to all his intimate acquaintances.

V. D. Berner became an honorary member at the last annual meeting at Allentown, where his active labor in providing for the comfort and accommodation, in gratuitously furnishing the hall, music, etc., for which his family and friends are entitled to our grateful recognition; therefore,

Resolved, That we extend to the families and friends of these our above named co-workers in the advancement of horticulture our sincere and kindest sympathy and condolence, and hope their couch now rest in a bower of flowers that may live forever.

Resolved, That these resolutions to be recorded in the minute book of the Association.

CALVIN COOPER,
HENRY C. SNAVELY,
E. C. BRINSER.

RESOLUTIONS.

Resolved, That we tender our thanks to the Commissioners of Lancaster county for the gratuitous use of the court room for our evening session, and to the North End Club for their excellent music for said meeting.

Resolved, That our thanks are due to the local committee of arrangements for the very able manner in which they discharged their duties, and provided for our comfort and convenience.

Resolved, That we extend our thanks to the press of Lancaster for their excellent reports of our proceedings.

STATE HORTICULTURAL ASSOCIATION OF PENNSYLVANIA.

OFFICERS FOR 1899.

PRESIDENT.

Howard A. Chase,Philadelphia.

FIRST VICE PRESIDENT.

Howard B. Chase,Philadelphia.

SECOND VICE PRESIDENT.

Calvin Cooper,Bird-in-Hand.

THIRD VICE PRESIDENT.

Gabriel Hiester,Harrisburg.

RECORDING SECRETARY.

Enos B. Engle,Waynesboro.

CORRESPONDING SECRETARY.

Wm. P. Brinton,Christiana.

TREASURER.

Samuel C. Moon,Morrisville.

**PROGRAMME OF THE FORTIETH ANNUAL
MEETING OF THE STATE HORTICULTURAL
ASSOCIATION OF PENNSYLVANIA, HELD IN
THE SUPREME COURT ROOM, HARRISBURG,
PA., JANUARY 18 AND 19, 1899.**

ORDER OF BUSINESS.

Wednesday, January 18, 1899, 10 A. M.

1. Opening Announcement.
2. Reading of Minutes of Previous Meeting.
3. Roll Call and Collection of Dues.
4. Election of Officers.
5. Reports of Officers.
6. Reports of Standing Committees.
7. Reports of Special Committees.
8. Address of Welcome.

Hon. J. D. Patterson, Mayor of Harrisburg.

9. Appointment of Committees.

Wednesday Afternoon, January 18, 1899, 2 P. M.

10. Report of General Fruit Committee.
Henry C. Snavely, Chairman, Lebanon, Pa.
11. Fruit Growing in Central Pennsylvania.
J. E. Jamison, Swales, Pa.
12. Some of Our Mistakes.
C. W. Good, Waynesboro, Pa.
13. Horticulture Retrospective Ten Years.
E. C. Brinser, Middletown, Pa.
14. The Marketing of Fruit.
A. N. Brown, Wyoming, Del.
15. Marketing Small Fruits.
For General Discussion.
16. Question Box.

Wednesday Evening, January 18, 1899.

17. President's Annual Address.
Prof. S. B. Heiges, York, Pa.
 18. A Successful Warfare Against the San Jose Scale.
Prof. W. G. Johnson, State Entomologist of Maryland, College Park, Md.
 19. The Best Mode of Dealing with Insects Destructive to Fruit Trees.
Prof. R. C. Schiedt, Lancaster, Pa.
 20. Legislation Needed as to San Jose Scale and Other Insects.
For General Discussion.
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Thursday, January 19, 1899, 9.00 A. M.

21. Reports of Committees—Unfinished and New Business.
 22. Room on Top.
W. H. Stout, Pine Grove, Pa.
 23. The Peach as a Profitable Fruit.
John F. Boyer, Mt. Pleasants Mills, Pa.
 24. Quince Culture.
W. B. K. Johnson, Allentown, Pa.
 25. On the Principles of Improvement in Fruits and Flowers.
Thomas Meehan, Germantown, Pa.
 26. Farm Development as it Relates to Horticulture.
H. G. McGowan, Geiger's Mills, Pa.
 27. My Experience with Apple Tree Borers.
Theodore Day, Dyberry, Pa.
 28. Question Box.
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Thursday Afternoon, January 19, 1899, 1.30 P. M.

29. Reports of Committees.
30. Nature Study in Schools and its Ultimate Benefit to Horticulture.
Frank M. Bartram, London Grove, Pa.
31. The Gypsy Moth in Massachusetts, and Its Importance to Pennsylvania.
Prof. H. T. Fernald, Economic Zoologist, Department of Agriculture, Harrisburg, Pa.
32. Legislation Needed for Horticulture.
Hon. William T. Creasy, Catawissa, Pa.
33. General Discussion of the Subject of Legislation.

MINUTES OF THE ANNUAL MEETING OF THE STATE HORTICULTURAL ASSOCIATION OF PENNSYLVANIA.

HELD AT HARRISBURG, PA., JANUARY 18 AND 19, 1899.

Wednesday Morning, January 18, 1899.

The fortieth annual meeting of the State Horticultural Association of Pennsylvania assembled in the Supreme Court room, in the city of Harrisburg, on Wednesday morning, January 18, 1899.

The Association was called to order by the President, S. B. Heiges, of York, who announced that at a meeting of the officers in December, the time for the meeting had been postponed for one day, on account of the inauguration of the Governor of Pennsylvania taking place on Tuesday, January 17.

MAYOR'S LETTER.

Hon. J. D. Patterson, Mayor of Harrisburg, was to have extended an address of welcome, but was unable to be present on account of illness. He sent, however, a letter in the nature of an address, which was read by the Secretary.

President Heiges announced that the Treasurer, J. Hibbard Bartram, would not be present, and Samuel C. Moon, of Morrisville, would officiate as treasurer *pro tem*.

A recess was then taken to enable members to pay their dues.

COMMITTEES APPOINTED.

The following committees were announced after the meeting had again been called to order:

Auditing Committee.—Thos. Rakestraw, Jacob L. Rife, W. H. Stout.

Committee on Nomenclature.—H. C. Snavely, Dan'l Smeych, H. E. Van Deman.

Resolutions on Deceased Members.—Calvin Cooper, F. M. Bartram, A. W. Root.

General Fruit Committee.—Henry C. Snavely, Chairman.

Legislation.—Cyrus T. Fox, Gabriel Hiester, W. P. Brinton, J. E. Jamison, W. H. Stout.

Wednesday Afternoon, January 18, 1899.

Upon the reconvening of the Association at 2 P. M., the report of the General Fruit Committee was read by the chairman, Henry C. Snavelly, giving the pomological and horticultural results of the past year in every county in the State.

J. E. Jamison, of Juniata county, followed with a paper on "Fruit Growing in Central Pennsylvania."

This paper was considered in connection with the report of the General Fruit Committee, and both were discussed by a number of the members.

The report of the General Fruit Committee was received with a vote of thanks to the chairman, Henry C. Snavelly, for his excellent compilation.

C. W. Good, of Waynesboro, read a paper on "Some of Our Mistakes."

"Horticulture, Retrospective Ten Years," was the subject of a well-prepared paper by E. C. Brinser, of Middletown, which was then read. It was discussed by W. H. Stout, Hon. Geo. D. Stitzel and others.

A. N. Brown, of Wyoming, Del., then read a paper on "The Marketing of Fruit," which was followed by a discussion on "Marketing Small Fruits" and incidentally, of Mr. Brown's paper, in which Messrs. H. A. Chase, J. E. Jamison, W. P. Brinton, H. E. Van Deman, W. H. Stout, W. Fulmer, Senator Gerard C. Brown and President Heiges participated.

The Association then adjourned to 7.30 P. M.

Wednesday Evening, January 18, 1899.

Upon re-convening in the evening, President Heiges delivered his annual address.

Prof. W. G. Johnson, State Entomologist of Maryland, followed with a learned talk on "A Successful Warfare Against the San Jose Scale." He consumed an hour in his remarks, which were illustrated by views thrown by means of a stereopticon upon a large canvass.

Then followed one of the finest lectures that was ever delivered before the Association. It was by Prof. R. C. Schiedt, of Franklin and Marshall College, Lancaster, on "The Best Mode of Dealing with Insects Destructive to Fruit Trees."

A general discussion on "Legislation as to San José Scale and Other Insects," concluded the business of evening session.

Adjourned to Thursday at 9.00 A. M.

Thursday Morning, January 19, 1899.

The Association re-convened in the Supreme Court room at 9 o'clock.

REPORTS OF COMMITTEES.

The report of the Committee on Nomenclature was read by Prof. H. E. Van Deman, which was on motion, received.

The report of the Committee of Necrology was read.

The report of the committee to audit the account of Cyrus T. Fox, Secretary, was read, showing receipts of \$78.50, and disbursements of \$78.75. The report was received and the committee discharged.

ELECTION OF OFFICERS.

The selection of a place for holding the next meeting of the Association was then brought up.

Reading and Pittsburg were nominated.

W. Fulmer, of Allegheny county, made a earnest speech in behalf of meeting "west of the mountains."

Pittsburg was then selected, having received 19 votes to Reading's 8.

The Association then proceeded to the nomination and election of officers, when the following nominations were made:

President.—S. B. Heiges, York.

Vice Presidents.—Howard A. Chase, Philadelphia; Calvin Cooper, Bird-in-Hand; Gabriel Hiester, Harrisburg.

Recording Secretary.—E. B. Engle, Waynesboro.

Corresponding Secretary.—William P. Brinton, Christiana.

Treasurer.—Samuel C. Moon, Morrisville.

Cyrus T. Fox was also re-nominated for Recording Secretary, but declined.

There being no opposition to the candidates placed in nomination, on motion of H. C. Snively, the Secretary was instructed to cast the ballot for the Association for the above ticket.

President Heiges announced the following Committee of Arrangements for the next meeting: W. Fulmer, M. C. Dunlevy, George Philips, J. E. Handenshield, J. S. Burns, James L. Fisher, E. B. Engle.

The consideration of the regular programme of topics was then resumed. W. H. Stout read a paper on "Room on Top."

John F. Boyer followed with a paper on "The Peach as a Profitable Fruit."

W. B. K. Johnson read a paper on "Quince Culture."

A paper on "The Principles of Improvement in Fruits and Flowers," by Thomas Meehan, of Germantown, was read by the Secretary.

"My Experience with the Apple Tree Borer," was the subject of a short paper by Theodore Day, of Dyberry, Pa., which the Secretary read.

The Association then adjourned to 1.30 P. M.

Thursday Afternoon, January 19, 1899.

The afternoon session opened with a short talk on "Nature Study in Schools and its Ultimate Benefit to Horticulture," by Frank M. Bartram.

"The Gypsy Moth in Massachusetts, and its Importance to Pennsylvania," was the subject of an exceedingly instructive lecture by Dr. H. T. Fernald, Economic Zoologist of the Department of Agriculture of Pennsylvania.

Hon. William T. Creasy, of Columbia county, spoke on "Legislation needed for Horticulture."

The subject was further discussed by President Heiges, Senator Gerard C. Brown, Dr. H. T. Fernald and the Secretary, Cyrus T. Fox.

A motion was adopted that President S. B. Heiges should be added to the Committee on Legislation.

A communication was read from the Dairymen's Union, inviting the Association to appoint a committee to meet with them in Harrisburg during the following week, in reference to legislation in behalf of the dairy and farming interests. The following committee was appointed: S. B. Heiges, Cyrus T. Fox, Geo. D. Stitzel, H. C. Snively, W. H. Stout.

On motion, Dr. H. P. Armsby, of the Pennsylvania Agricultural Experiment Station, was added to the committee.

Secretary Fox offered the following resolutions, which were adopted:

Resolved, That we tender our thanks to the Department of Public Grounds and Buildings, for the use of this chamber in which our sessions were held.

Resolved, That our thanks are due the local committee of arrangements, for the excellent manner in which they discharged their duties.

Resolved, That we tender our thanks to the press of Harrisburg for their reports.

On motion adjourned,

CYRUS T. FOX,
Secretary.

REPORT OF THE COMMITTEE OF NECROLOGY.

Your committee sincerely regret, that it becomes our painful duty to announce the death of three of our most active and useful members, since the last annual meeting, held one year ago at Lancaster City, as follows:

Casper Hiller of Conestoga, Lancaster Co., a life member was one of the original pioneers at the organization of the Association in 1859 at Lancaster. Though modest and retiring, he was a zealous worker, a close observer and racy writer in the advancement of the science of horticulture, one whose knowledge was relied upon and whose judgment was profoundly respected. Articles prepared by him being among the most valuable of those of the Association. While the society was in its infancy he was soon recognized as one of the most careful and conscientious members, and he has acceptably filled the office of Vice President.

Peter Hiller, of Conestoga, Lancaster Co., was a regular attendant of our meetings, always interested in its activities, and whose criticisms were of such value. The universal satisfaction felt at his selection as chairman of the General Fruit Committee was evidence of the confidence and esteem in which he was held by his fellow members. He held this position at the time of his death.

W. H. Johnson, of Elk county, of the General Fruit Committee, was a most useful member, looking after the interests of the Association in his section of the State with great faithfulness; not only exercising his personal interest in behalf of the Association, but endeavoring to arouse the interest of the people of his section of the State through the newspapers, to which he contributed articles in behalf of the Association. Although located in a mountainous district, where fruit growing was carried on under very trying circumstances, he did much to encourage and foster this great industry.

Your committee, pursuant to the object of its appointment, in scanning the list of fellow-members lately called from active service, are made sadly conscious of the passing of useful men, men whose aid and efforts for this society were of such value, men whose personal presence at our meetings was so pleasant and so inspiring, and whose life service in behalf of our chosen cause of such benefit. We desire that their lives and works be an inspiration to us all, and as in the work of a household, the absence of one causes the remaining ones to increase their labors that wonted tasks be accomplished, so let it be now in our field of work, that we so augment

our efforts for the welfare of others that total usefulness be not lessened and there may thus be raised a monument of respect for the deceased.

Our heartfelt sympathies are with the families of these members.

C. COOPER,
FRANK M. BARTRAM,
A. W. ROOT.

PATRONS OF HUSBANDRY.

OFFICERS OF PENNSYLVANIA STATE GRANGE FOR THE YEAR 1900.

MASTER.

W. F. Hill, Westford, Crawford county.

OVERSEER.

E. S. Tuttle, Wellsboro, Tioga county.

LECTURER.

William Packard, Windfall, Bradford county.

STEWARD.

H. M. Gooderham, Patton, Cambria county.

ASSISTANT STEWARD.

A. H. S. Taggart, King of Prussia, Montgomery county.

TREASURER.

S. E. Nivin, Landenburg, Chester county.

SECRETARY.

J. T. Ailman, Thompsonstown, Juniata county.

GATEKEEPER.

W. Chase, Fall Brook, Tioga county.

CERES.

Mrs. V. B. Holiday, Crooked Creek, Tioga county.

LADY STEWARD.

Harvia Faust, Montgomery, Lycoming county.

CHAPLAIN.

Rev. David H. Lauback, .. Fairmount Springs, Luzerne county.

FLORA.

Florence Rhone,Centre Hall,Centre county.

POMONA.

L. A. Thayer,Crawford county.

FINANCE COMMITTEE.

D. B. McWilliams,Port Royal,Juniata county.

John Patton,Warriors' Mark,Huntingdon county.

EXECUTIVE COMMITTEE.

Louis Piolet,Wysox,Bradford county.

S. S. Blyholder,Leechburg,Armstrong county.

G. W. Oster,Osterburg,Bedford county.

I. Frank Chandler,Toughkenamon,Chester county.

THE GRANGE.

ORDER OF PATRONS OF HUSBANDRY.

ITS ORIGIN.

The Order of the Patrons of Husbandry originated in the mind of O. H. Kelley, a man of New England birth, who went to Minnesota in his early manhood, and became a farmer in that section of the country.

In 1864 he was appointed a clerk in the Department of Agriculture at Washington. Two years later, in January, 1866, Mr. Kelley was commissioned by Hon. Isaac Newton, Commissioner of Agriculture, to visit the Southern states, lately in hostility to the government, for the purpose of obtaining statistical and other information in regard to the condition of the South, and report the same to the Department at Washington.

It was while traveling in the South in obedience to these instructions, that the thought of a secret society of agriculturists, for the protection and advancement of their interests, and as an element to restore kindly feelings among the people, first occurred to Mr. Kelley.

The idea of giving women full membership in the proposed Order originated with Miss Carrie A. Hall, of Boston, Mass., a niece of Mr. Kelley, to whom he had imparted his views of the new association after his return from the South. In the full formation of the Order, six other men were directly associated with Mr. Kelley, namely, William Saunders of the Department of Agriculture, who next to Mr. Kelley did most in originating the Order, Rev. A. B. Grosh, of the same Department, William M. Ireland of the Postoffice Department, Rev. John Trimble and J. R. Thompson of the Treasury Department, and F. M. McDowell, a pomologist of Wayne, N. Y., all of whom, with one exception, were born upon a farm.

These seven men were the founders of the Order, and for nearly two years they labored with great energy, and with a faith and zeal amounting almost to inspiration, until with the assistance of friends who became interested in the plan, they completed a well-devised scheme of organization, based upon a ritual of four degrees for men and four for women, which is unsurpassed in the English language for originality of thought, purity of sentiment, and beauty of diction.

Having formed a constitution to govern the Order to which this ritual was adopted, these men met on the fourth day of December, 1867, and constituted themselves the National Grange of the Patrons of Husbandry, with William Saunders as master, J. R. Thompson, lecturer, William M. Ireland, treasurer, and O. H. Kelley, secretary. The remaining offices, for obvious reasons, were left vacant.

The little brown building in which the organization was effected was at that time the office of Mr. Saunders, and stood embowered with the trees in the gardens of the Agricultural Department on the corner of Four-and-a-half street and Missouri avenue. Later, the late Colonel Aiken of South Carolina, and other interested members of the Order made vigorous efforts to have the government preserve this historic building, but they were unsuccessful in their efforts.

The first Subordinate Grange was organized in Washington, D. C., the 8th day of January, 1868, as a school of instruction, with William M. Ireland as master.

The first dispensation for a Grange was granted at Harrisburg, Pa., the 4th day of April, 1868, but the first regular Subordinate Grange to which a charter was issued was organized at Fredonia, N. Y., the 16th day of April, 1868.

The first State Grange, that of Minnesota, was organized the 22d day of February, 1869. The new Order made slow progress up to 1872, only 257 Granges having been organized in the entire country. During the year 1872, 1,105 were organized and the Order had an existence in twenty-two States.

The first meeting of the National Grange, as a delegate body, was held at Georgetown, D. C., the 8th day of January, 1873, with six of the founders of the Order and seventeen delegates present, representing eleven States; six of the delegates were masters of State Granges, and the remainder were deputies in the Order. In addition to these, four women were present, viz: Miss Carrie A. Hall, Mrs. O. H. Kelley, Mrs. D. W. Adams and Mrs. J. C. Abbott. The total number of Granges organized previous to this meeting was 1,362. Nearly 30,000 charters have been issued to January 1, 1900.

DECLARATION OF PURPOSES OF THE PATRONS OF HUSBANDRY.

PREAMBLE.

Profoundly impressed with the truth that the National Grange of the United States should definitely proclaim to the world its general objects, we hereby unanimously make this Declaration of Purposes of the Patrons of Husbandry:

GENERAL OBJECTS.

1. United by the strong and faithful tie of Agriculture, we mutually resolve to labor for the good of our Order, our country, and mankind.

2. We heartily endorse the motto: "In essentials, unity; in non-essentials, liberty; in all things, charity."

3. We shall endeavor to advance our cause by laboring to accomplish the following objects:.

To develop a better and higher manhood and womanhood among ourselves. To enhance the comforts and attractions of our homes, and strengthen our attachments to our pursuits. To foster mutual understanding and co-operation. To maintain inviolate our laws, and to emulate each other in labor, to hasten the good time coming. To reduce our expenses, both individual and corporate. To buy less and produce more, in order to make our farms self-sustaining. To diversify our crops, and crop no more than we can cultivate. To condense the weight of our exports, selling less in the bushel and more on hoof and in fleece; less in lint, and more in warp and woof. To systematize our work, and calculate intelligently on probabilities. To discountenance the credit system, the mortgage system, the fashion system, and every other system tending to prodigality and bankruptcy.

We propose meeting together, talking together, working together, buying together, selling together, and, in general, acting together for our mutual protection and advancement, as occasion may require. We shall avoid litigation as much as possible by arbitration in the Grange. We shall constantly strive to secure entire harmony, good will, vital Brotherhood among ourselves, and to make our Order perpetual. We shall earnestly endeavor to suppress personal, local, sectional, and national prejudices, all unhealthy rivalry, all selfish

ambition. Faithful adherence to these principles will insure our mental, moral, social, and material advancement.

BUSINESS RELATIONS.

4. For our business interests, we desire to bring producers and consumers, farmers and manufacturers, into the most direct and friendly relations possible. Hence we must dispense with a surplus of middle men, not that we are unfriendly to them, but we do not need them. Their surplus and their exactions diminish our profits.

We wage no aggressive warfare against any other interests whatever. On the contrary, all our acts and all our efforts, so far as business is concerned, are not only for the benefit of the producer and consumer, but also for all other interests that tend to bring these two parties into speedy and economical contact. Hence we hold that transportation companies of every kind are necessary to our success, that their interests are intimately connected with our interests, and harmonious action is mutually advantageous, keeping in view the first sentence of our Declaration of Principles of action, that "Individual happiness depends upon general prosperity."

We shall, therefore, advocate for every State the increase in every practical way, of all facilities for transporting cheaply to the seaboard, or between home producers and consumers, all the productions of our country. We adopt it as our fixed purpose to "open out the channels in nature's great arteries, that the life blood of commerce may flow freely."

We are not enemies of railroads, navigable and irrigating canals, nor any corporation that will advance our industrial interests, nor of any laboring classes.

In our noble Order there is no communism, no agrarianism.

We are opposed to such spirit and management of any corporation or enterprise as tends to oppress the people and rob them of their just profits. We are not the enemies to capital, but we oppose tyranny of monopolies. We long to see the antagonism between capital and labor removed by common consent, and by an enlightened statesmanship worthy of the nineteenth century. We are opposed to excessive salaries, high rates of interest and exorbitant per cent. profits in trade. They greatly increase our burdens, and do not bear a proper proportion to the profits of producers. We desire only self-protection, and the protection of every true interest of our land, by legitimate transactions, legitimate trade, legitimate profits.

EDUCATION.

We shall advance the cause of education among ourselves, and for our children, by all just means within our power. We especially ad-

vocate for our agricultural and industrial colleges, that practical agriculture, domestic science, and all the arts which adorn the home, be taught in their courses of study.

THE GRANGE NOT PARTISAN.

5. We emphatically and sincerely assert the oft repeated truth taught in our organic law, that the Grange—National, State, or Subordinate—is not a political or party organization. No grange, if true to its obligations, can discuss partisan or sectarian questions, nor call political conventions, nor nominate candidates, nor even discuss their merits in its meetings.

Yet the principles we teach underlie all true politics, all true statesmanship, and if properly carried out, will tend to purify the whole political atmosphere of our country. For we seek the greatest good to the greatest number.

We must always bear in mind that no one, by becoming a Patron of Husbandry, gives up that inalienable right and duty which belongs to every American citizen, to take a proper interest in the politics of his country.

On the contrary, it is right for every member to do all in his power legitimately to influence for good the action of any political party to which he belongs. It is his duty to do all he can in his own party to put down bribery, corruption, and trickery; to see that none but competent, faithful and honest men, who will unflinchingly stand by our interests, are nominated for all positions of trust; and to have carried out the principle which should always characterize every Patron, that the office should seek the man, and not the man the office.

We acknowledge the broad principle that difference of opinion is no crime, and hold that "progress toward truth is made by difference of opinion," while "the fault lies in bitterness of controversy."

We desire a proper equality, equity and fairness; protection for the weak, restraint upon the strong, in short, justly distributed burdens and justly distributed power. These are American ideas, the very essence of American independence, and to advocate to the contrary is unworthy of the sons and daughters of the American Republic.

We cherish the belief that sectionalism is, and of right should be, dead and buried with the past. Our work is for the present and future. In our agricultural brotherhood and its purposes, we shall recognize no North, no South, no East, no West.

It is reserved by every Patron, as the right of a freeman, to affiliate with any party that will best carry out his principles.

OUTSIDE CO-OPERATION.

6. Our being peculiarly a farmers' institution, we cannot admit all to our ranks.

Many are excluded by the nature of our organization, not because they are professional men, or artisans, or laborers, but because they have not a sufficient direct interest in tilling the soil, or may have some interest in conflict with our purposes. But we appeal to all good citizens for their cordial co-operation to assist in our efforts towards reform, that we may eventually remove from our midst the last vestige of tyranny and corruption.

We hail the general desire for fraternal harmony, equitable compromise, and earnest co-operation, as an omen of our future success.

CONCLUSION.

7. It shall be an abiding principle with us to relieve any of our oppressed and suffering brotherhood by any means at our command.

Last, but not least, we proclaim it among our purposes to inculcate a proper appreciation of the abilities and sphere of women, as is indicated by admitting her to membership and position in our Order.

Imploring the continued assistance of our Divine Master to guide us in our work, we here pledge ourselves to faithful and harmonious labor for all future time, to return by our united efforts to the wisdom, justice, fraternity, and political purity of our forefathers.

PENNSYLVANIA FARMER'S ALLIANCE AND INDUSTRIAL UNION.

OFFICERS FOR 1900.

PRESIDENT.

W. A. Gardner, Andrews' Settlement.

VICE PRESIDENT.

G. W. Branthaver, New Franklin.

SECRETARY AND BUSINESS AGENT.

D. M. Omwake, Greencastle.

LECTURERS.

District No. 1, Northeast.

W. F. Kilmer, Waymart.

District No. 2, Northwest.

A. K. Earle, Inez.

District No. 3, Southwest.

R. J. Nedimyer, St. Lawrence.

District No. 4, Southeast.

A. B. Lehman, Fayetteville.

EXECUTIVE BOARD.

W. A. Gardner, Chairman, Andrews' Settlement.

G. W. Kilmer, Secretary, Towanda.

A. J. Robinson, Greenville.

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O. F. Berger, Shartlesville.

CONSTITUTION AND BY-LAWS OF THE PENNSYLVANIA STATE FARMERS' ALLIANCE AND INDUSTRIAL UNION.

DECLARATION OF PURPOSES.

Whereas, The general condition of our country imperatively demands unity of action on the part of the farming and laboring classes, reformation in economy, and the dissemination of principles best calculated to encourage and foster agricultural and mechanical pursuits, encouraging the toiling masses, leading them in the road to prosperity, and providing a just and fair remuneration for labor, a just exchange for our commodities, and the best means of securing to the laboring classes the greatest amount of good; we hold to the principle that all overpowering monopolies are dangerous to the best interests of our country, tending to enslave a free people, and subvert and finally overthrow the great principles purchased to the fathers of American liberty. We, therefore, adopt the following as our declaration of principles:

1. To labor for the education of the agricultural classes in the science of economical government, in a strict non-partisan spirit, and to bring about a more perfect union of said classes.

2. That we demand equal rights, and exact justice to all and special favors to none.

3. To endorse the motto, "In things essential, unity; and in all things, charity."

4. To develop a better state, mentally, morally, socially and financially.

5. To constantly strive to secure entire harmony and good will to all mankind, and brotherly love among ourselves.

6. To suppress personal, local, sectional and national prejudices; all unhealthy rivalry, and all selfish ambition.

7. The brightest jewels which it garners are the tears of widows and orphans, and its imperative commands are to visit the homes where lacerated hearts are bleeding; to assuage the sufferings of a brother or sister; bury the dead, care for the widows, and educate the orphans; to exercise charity towards offenders; to construe words and deeds in their most favorable light, granting honesty of purpose and good intention to others; and to protect the principles of the

Alliance unto death. Its laws are reason and equity; its cardinal doctrines inspire purity of thought and life; its intention is, "on earth peace and good will toward men."

8. We are, furthermore, more than ever profoundly impressed with the importance of unity of action in practice, as well as theory, in order that the true interests of the country, as well as the town and city, may be completely subserved.

PENNSYLVANIA STATE COLLEGE.
SCHOOL OF AGRICULTURE.

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Lecturer on Stock Feeding.

WILLIAM A. BUCKHOUT, M. S.,
Professor of Botany and Horticulture.

WILLIAM FREAR, Ph. D.,
Professor of Agricultural Chemistry.

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Professor of Agriculture and Superintendent of Correspondence Courses.

LEONARD PEARSON, B. S., V. M. D.,
Special Lecturer on Veterinary Science.

GEORGE C. BUTZ, M. S.,
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HARRY HAYWARD, B. S.,
Assistant Professor of Dairy Husbandry.

C. A. BROWNE, JR., A. M.,
Assistant in Agricultural Chemistry.

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LOUIS E. REBER, M. S.,
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Professor of Zoology.

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JOSEPH M. WILLARD, B. A.,
Professor of Mathematics.

FRED. LEWIS PATTEE, M. A.,
Professor of English and Rhetoric.

CARL D. FEHR, M. A.,
Assistant Professor of German.

ANNA E. REDIFER,
Assistant Professor of Industrial Art and Design .

IRVING L. FOSTER, M. A.,
Instructor in the Romance Languages.

ELIZABETH B. MEEK, M. S.,
Instructor in Zoology.

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 ENOS H. HESS,Assistant to the Director.
 CHARLES ALBERT BROWNE, Jr., M. A., } Assistant Chemists.
 CASSIUS W. NORRIS, }
 JAMES P. PILLSBURY,Assistant in Horticulture.
 M. S. McDOWELL, M. S., } Assistant Chemists.
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Telegraph and Post Office, }State College, Centre County, Pa.
Railroad and Express Station, }

Telephone Connection.

The bulletins and reports of the Station will be mailed regularly, free of charge, to all residents of the State who request it, so far as the supply will permit. Address, *Director of Experiment Station, State College, Centre County, Pa.*

Visitors will be welcomed at all times and given every opportunity to inspect the Station in all its departments.

6-6-99

PENNSYLVANIA FORESTRY ASSOCIATION.

President, John Birkinbine.

Vice Presidents, Herbert Welsh.

Wm. S. Harvey,

Richard Wood,

James C. Haydon,

Howard M. Jenkins.

General Secretary, Dr. Joseph T. Rothrock.

Corresponding Secretary, Mrs. John P. Lundy.

Treasurer, Charles E. Pancoast.

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At Large, Mrs. Brinton Coxe,

Rev. Alfred L. Elwyn.

Alfred C. Harrison.

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Allegheny county, Hon. Geo. W. Guthrie,

George M. Lehman,

Henry Phipps.

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Clinton county, A. F. Ryon.

Crawford county, George W. Barr, M. D.

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Dauphin county, E. C. Felton,

James McCormick.

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Elk county, Hon. George R. Dixon.

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Fayette county, Hon. Nathaniel Ewing.

Forest county, Samuel D. Irwin.

Franklin county, Col. T. B. Kennedy.

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Huntingdon county, Mrs. William Dorris.
Jefferson county, J. C. Cochran, M. D.
Lackawanna county, G. Edgar Dean, M. D.,
Hon. L. A. Watres.
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Lebanon county, Mrs. Bertham Dawson Coleman.
Lehigh county, Oliver Williams.
Luzerne county, Mrs. Eckley B. Coxe,
Col. R. Bruce Ricketts,
Gen. Paul A. Oliver,
I. A. Stearns.
Lycoming county, Dr. B. H. Detwiler.
Mercer county, Jonas J. Pierce.
Montgomery county, Dr. J. M. Anders,
Dr. Alice Bennett,
Mon. B. Witman Dambly,
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Dr. J. Newton Hunsberger,
Dr. Samuel Wolfe.
Montour county, Isaac X. Grier.
Northampton county, Dr. Thomas M. Drown,
Hartley C. Wolle.
Northumberland county, G. R. Van Allen.
Perry county, Mrs. John Wister.
Philadelphia county, Hon. W. N. Ashman,
Henry Budd,
Henry Howson,
Joseph W. Johnson,
J. Rodman Paul,
Albert B. Weimer,
Dr. W. P. Wilson.
Pike county, Arthur M. Adams.
Potter county, Arthur B. Mann.
Schuylkill county, Wm. L. Sheaffer,
Heber S. Thompson.
Somerset county, H. D. Moore, M. D.
Snyder county, J. M. Boyer.
Sullivan county, Hon. B. W. Jennings.
Susquehanna county, Edgar A. Turrell.
Tioga county, Charles Tubbs.
Union county, George G. Groff, M. D.
Venango county, Prof. C. A. Babcock.
Warren county, James O. Parmlee.
Washington county, Wm. Parkison Warne.
Wayne county, Alonzo T. Searle.
Westmoreland county, Hon. Lucien W. Doty.
Wyoming county, James W. Piatt.
York county, Dr. I. C. Gable.

LIST OF FARMERS' CLUBS IN THE STATE

County.	Name of Club.	Name and Address of President.	Name and Address of Secretary.
Allegheny,	Gardeners' Association,	M. C. Dunlevy, Carnegie,	J. M. Handersfield, Green Tree.
.....	Farmers' Association,	M. F. Fife, Upper St. Clair,	Wm. Caldwell, Upper St. Clair.
Berks,	Oakdale,	Thos. J. C. Morrow, Hickman,	P. F. Humel, Oakdale.
Bradford,	Farmers' Union,	E. M. Zerr, Geiger's Mills,	Jas. E. Eastman, Orwell.
Chester,	Orwell's Farmers,	Jos. T. Phillips, West Grove,	I. R. Chambers, Toughkenamon.
.....	West Grove,	James Keech, Thorndale,	Mrs. Clara Webster, Hopewell.
.....	Practical Farmers,	Mahlon Brosius, Chatham,	Mrs. C. Darlington, Pomeroy.
.....	Doe Run,	John McCormick, Harrisburg,	James Cable, Shiremanstown.
Cumberland,	McCormick's,	S. S. Leady, Marion,	D. C. Croft, Marion.
Franklin,	Farmer's Association,	Abel Thompson, Aliens Mills,	J. F. Morrison, Aliens Mills.
Jefferson,	Washington Township,	Edwin Chambers, Chatham,	Carrie W. Chambers, Chatham.
Lancaster,	Octoraro,	Neale Hamilton, Goshen,	H. M. Grigsby, New Castle.
Lawrence,	Fulton,	Samuel McCreary, Neshamock Falls,	A. C. Henry, Hughesville.
Lycoming,	Farmers' Institute,	Theo. A. Boak, Hughesville,	W. H. Jang, Jacksonville.
Lehigh,	Muncy Valley,	John K. Fugate, Jacksonville,	William Reed, H. Connack.
.....	Industrial Union,	John Bittling, Hoesneck,	Thomas Ott, Limerport.
.....	Honesock,	William Laubach, Lenark,	Charles Schlenker, Seipstown.
.....	Limerport,	Milton Zimmerman, Seipstown,	Harry Lichenwalner, S. Whitehall.
.....	Buckhorn,	Benj. Smith, S. Whitehall,	Milton Poters, Orefield.
.....	S. Whitehall,	Uriah Schuler, Orefield, .....	.....
.....	Hoffmansville,	R. D. Kerr, Sandy Lake, .....	.....
Mercer,	Mill Creek,	Howard Williams, Horsham,	William Smith, Pottstown.
Montgomery,	Horsham,	Jesse S. Kriebel, Worcester,	C. C. McWilliams, Elysburg.
.....	Farmers' Union,	J. H. Holderman, Pottstown,	Frank Woodcock, Raymond.
Northumberland,	Farmers' Union,	Ira Bishop, Andrew's Settlement,	Prof. Geo. Sterms, Harford.
Potter,	Elysburg,	R. L. Burk, Montrose,	F. A. Davies, Dundaff.
Susquehanna,	Farmers' Association,	John Crooks, Murdockville,	L. H. Ball, Montrose.
.....	Harford,	John G. Gailey, Finleyville,	W. H. Englefield, Frankfort Springs.
.....	Clifford,	J. W. Anderson, Stewartstown,	T. J. McClelland, Finleyville.
.....	Montrose,	C. Z. March, Rossville,	M. E. Smith, Norrisville.
Washington,	Monroe, .....	.....	M. L. Brenneman, Wellsville.
.....	Hanover Township, .....	.....	.....
.....	Citizens Co-operation, .....	.....	.....
.....	Norrisville, .....	.....	.....
York,	Warrington, .....	.....	.....

List of County and Local Agricultural Societies, with Names and Addresses of Secretaries and Dates for Holding Fall Exhibitions of 1899.

[Those marked with an * are represented in the Board of Agriculture by elected members.]

COUNTY.	Corporate Name of Society.	Name and Address of Secretary.	Where Held.	When Held.
	PENNSYLVANIA STATE AGRICULTURAL SOCIETY,	H. C. Demming, Harrisburg,	Lancaster,	Oct. 9-14.
	STATE HORTICULTURAL ASSOCIATION,	E. B. Engle, Waynesboro', .....	.....	No fair.
	GRANGERS' INTERSTATE PICNIC EXHIBITION,	R. H. Thomas, Mechanicsburg, ..	Williams' Grove, ...	Aug. 28, Sept. 2.
	MT. GRETN AGRICULTURAL, MECHAN. & INDUS. EX., ..	Dr. S. P. Hellman, Hellmandale, ..	Mt. Gretna,	Aug. 14-19.
	PATRONS OF HUSBANDRY EXHIBITION,	L. Rhone, Centre Hall,	Centre Hall,	Sept. 15-22.
	PENNSYLVANIA STATE DAIRYMEN'S ASSOCIATION,	G. H. St. John, Meadville, .....	.....	No fair.
Adams,*	Adams County Agricultural Association,	D. Toot, Table Rock, .....	.....	No fair.
Allegheny,*	Tarentum Fair Association,	J. C. Dunn, Tarentum,	Tarentum,	Aug. 29, Sept. 1.
Armstrong,*	Dayton Agricultural and Mechanical Association,	E. Morrow, Dayton,	Dayton,	Sept. 26-29.
Do.	Parker Tri-County Fair Association,	S. W. Coe, Parkers' Landing, ..	Parker City,	Aug. 29, Sept. 1.
Do.	Kittanning Fair Association,	T. McConnell, Kittanning,	Kittanning,	Aug. 22-25.

List of County and Local Agricultural Societies—Continued.

[Those marked with an * are represented in the Board of Agriculture by elected members.]

COUNTY.	Corporate Name of Society.	Name and Address of Secretary.	Where Held.	When Held.
Beaver,*	Beaver County Agricultural Society,	L. S. Anderson, Beaver,	Beaver.	
Do.	Mill Creek Valley Agricultural Society, Limited,	R. M. Swaney, Hookstown,	Hookstown,	Aug. 22-24.
Bedford,*	Bedford County Agricultural Society,	Wm. I. Eicholtz,	Bedford.	
Berks,*	Agricultural and Horticultural Association of Berks County,	Cyrus T. Fox, Reading,	Reading,	Oct. 3-6.
Do.	Keystone Agricultural Society,	J. B. Esser, Kutztown,	Kutztown,	Sept. 26-27.
Blair,*	Blair County Agricultural Society,	Frank H. Fay, Hollidaysburg,	Hollidaysburg,	Sept. 12-15.
Bradford,*	Bradford County Agricultural Society,	Benj. Kuykendall, Jr., Towanda,	Towanda,	Sept. 26-29.
Do.	Union Agricultural Association,	C. D. Derrah, Canton,	Canton,	Sept. 19-22.
Do.	Troy Agricultural Society,	Jno. A. Parsons, Troy,	Troy,	Sept. 12-15.
Butler, *	Butler County Agricultural Society,	W. P. Roessing, Butler,	Butler,	Sept. 5-8.
Cambridge,*	Ebensburg Fair and Agricultural Society,	S. L. Reed, Ebensburg,	Ebensburg,	
Do.	Cambria County Agricultural Association,	J. V. Maucher, Carrolltown,	Carrolltown,	Sept. 5-8.
Do.	Tri-County Agricultural and Driving Park Association,	J. H. Laine, Johnstown,	Johnstown.	
Cameron,*	Cameron County Agricultural Association,	N. A. Ostrum, Emporium,		
Carbon,	Carbon County Industrial Society,	C. W. Bower, Lehighton,	Lehighton,	Sept. 26-29.

Centre,*	Centre County Agricultural Society,	John Kline, Howard,	.....	No fair.
Chester,*	Chester County Agricultural Society,	B. Lear, West Chester,	.....	No fair.
Do.	Oxford Agricultural Society,	H. C. Thomas, Oxford,	.....	Sept. 27-29.
Clarion,*	Clarion County Fair Association,	S. S. Laughlin, Clarion,	.....	Sept. 28-29.
Clearfield,*	Clearfield County Agricultural Society,	R. E. Shaw, Clearfield,	.....	Sept. 27-30.
Clinton,*	Clinton County Agricultural Society,	J. R. Porter, Mackeyville,	.....	No fair.
Columbia,*	Columbia County Agricultural Society,	A. N. Yost, Bloomsburg,	.....	Oct. 10-13.
Do.	Northern Columbia and Southern Luzerne Agricultural Society,	J. W. Evans, Berwick,	.....	No fair.
Crawford,*	Crawford County Agricultural Association,	M. W. Oliver, Conneautville,	.....	Sept. 12-14.
Do.	Central Crawford Agricultural Society,	J. O. Sherred, Cambridge,	.....	Sept. 19-22.
Cumberland,*	Cumberland County Agricultural Society,	W. H. McCrea, Carlisle,	.....	Sept. 26-29.
Dauphin,*	Gratz Driving Park and Agricultural Society,	J. W. Hoffman, Gratz,	.....	Aug. 23-26.
Do.	Agricultural Society of Dauphin County,	G. Hiester, Harrisburg,	.....	No fair.
Delaware,*	Delaware County Agricultural Society,	Joseph H. Paschall, Ward,	.....	No fair.
Esle,*	Northwestern Agricultural Society,	Geo. Blair, Corry,	.....	No fair.
Do.	Wattsburg Agricultural Society,	A. L. Phelps, Wattsburg,	.....	Sept. 5-7.
Do.	Edinboro' Agricultural Society,	J. J. McWilliams, Edinboro',	.....	Sept. 12-15.
Fayette,*	Fayette Fair Association,	W. W. Parshall, Uniontown,	.....	Sept. 5-8.
Franklin,*	Franklin County Farmers' Association,	C. B. Hege, Marion,	.....	No fair.
Fulton,*	Big Cove Agricultural Society,	Jas. W. Kendall, McConnellsburg,	.....	No fair.

List of County and Local Agricultural Societies—Continued.

[Those marked with an * are represented in the Board of Agriculture by elected members.]

COUNTY.	Corporate Name of Society.	Name and Address of Secretary.	Where Held.	When Held.
Greene,	Greene County Agricultural and Mechanical Society,	C. W. Barkman, Carmichaels, ..	Carmichaels,	Oct. 11-21.
Do.*	Greene County Agricultural and Horticultural Society,	J. R. Pipes, Waynesburg,	Waynesburg.	
Do.	Waynesburg Fair Association,	J. S. Carter, Waynesburg,	Waynesburg,	Oct. 3-4.
Huntingdon,*	Huntingdon County Agricultural Society,	W. A. Neff, Warriors' Mark, ...	.....	No fair.
Indiana,*	Indiana County Agricultural Society,	David Blair, Indiana,	Indiana,	Sept. 12-15.
Jefferson,*	Jefferson County Agricultural Society,	S. H. Whitehill, Brookville, ...	.....	No fair.
Do.	Punxsutawney Fair Association,	P. O. Fress, Punxsutawney, ...	Punxsutawney,	Aug. 29, Sep. 1.
Do.	Punxsutawney Agricultural Society,	D. M. McQuown, Punxsutawney, ..	.....	No fair.
Juniata,*	Juniata County Agricultural Society,	J. N. Groninger, Port Royal,	Port Royal,	Sept. 13-15.
Lackawanna,*	North Abington and Glenburn Farmers' Club,	Isaac Ellis, Glenburn, .....	.....
Do.	North Lackawanna Farmers' Association,	J. L. Stone, Waverly, .....	.....
Lancaster,*	Lancaster County Agricultural Society,	Simon L. Brandt, Marietta, ...	New Castle,	Oct. 13-14.
Do.	Lancaster County Agricultural and Horticultural Society,	F. R. Diffenderfer, Lancaster, ...	.....	No fair.
Do.	Warwick Driving Park Association,	H. H. Snively, Lititz,	Lancaster,	No fair.
Lawrence,*	Lawrence County Agricultural Society,	H. W. Grigsby, New Castle, ...	Lititz,	No fair. Sept. 23-30.

Lebanon,*	Lebanon County Agricultural and Horticultural Association,	W. R. Woolfy, Jonestown, .....	.....	No fair.
Do.	Lebanon Valley Fair Association,	Dr. W. B. Means, Lebanon,	Lebanon,	Sept. 5-8.
Lehigh,*	Lehigh County Agricultural Society,	W. K. Mohr, Allentown,	Allentown,	Sept. 19-22.
Lanserie,*	Dallas Union Agricultural Association,	E. M. Honeywell, Dallas,	Dallas, .....	.....
Lycorning,*	Muncy Valley Farmers' Club,	A. C. Henry, Hughesville,	Hughesville,	Sept. 19-22.
McKean,*	McKean County Agricultural Society,	J. B. Colcord, Port Allegany,	Port Allegany,	Sept. 19-22.
Do.	Agricultural and Breeders' Society,	James Quirk, Smethport, .....	.....	No fair.
Mercer,	Mercer County Agricultural Society,	Geo. H. Fowler, Stoneboro',	Stoneboro',	Oct. 3-5.
Do.	Mercer Central Agricultural Association,	J. P. Orr, Mercer,	Mercer,	Sept. 26-28.
Mifflin,*	Mifflin County Agricultural Society,	A. T. Hamilton, Lewistown, ....	.....	No fair.
Monroe,*	Monroe County Agricultural Society,	T. C. Brown, Stroudsburg,	Stroudsburg,	Sept. 5-8.
Montgomery,*	Montgomery, Berks and Chester Agricultural Society,	E. P. Ancona, Pottstown, .....	.....	No fair.
Montour,*	Montour County Agricultural Society,	W. K. West, Danville,	Danville, .....	.....
Northampton,*	Northampton County Agricultural Society,	J. J. Maus, Nazareth,	Nazareth,	Oct. 3-6.
Do.	Pennsylvania State Fair Association,	H. A. Groman, Bethlehem,	Bethlehem,	Sept. 12-15.
Northumberland,* ..	Milton Driving Park and Fair Association,	Edwin Paul, Milton,	Milton,	Oct. 3-6.
Perry,*	Perry County Agricultural Society,	James B. Eby, Newport,	Newport,	Sept. 19-22.
Philadelphia,*	Pennsylvania Horticultural Society,	David Rust, Philadelphia,	Philadelphia,	Nov. 7-11.
Potter,*	Potter County Agricultural and Horticultural Society,	C. L. Peck, Coudersport, .....	.....	No fair.
Do.	Farmers' and Breeders' Association,	D. S. Libbert, Coudersport, ....	.....	.....

List of County and Local Agricultural Societies—Continued.

[Those marked with an * are represented in the Board of Agriculture by elected members.]

County.	Corporate Name of Society.	Name and Address of Secretary.	Where Held.	When Held.
Schuykill,*	Orwigsburg Agricultural and Horticultural Society,	A. E. Brown, Orwigsburg,	Orwigsburg,	Aug. 29, Sep. 1.
Do.	Ringtown Agricultural Society,	L. Applegate, Shenandoah,	.....	.....
Snyder,*	Snyder County Agricultural Association,	G. S. Snyder, Middleburg,	.....	.....
Somerset,*	Somerset County Agricultural Society,	H. J. Hoffman, Somerset,	.....	.....
Sullivan,*	Sullivan County Agricultural Society,	M. R. Black, Forksville,	Forksville,	.....
Susquehanna,*	Susquehanna County Agricultural Society,	W. A. Titsworth, Montrose,	Montrose,	Sept. 19-20.
Do.	Harford Agricultural Society,	E. E. Jones, Harford,	Harford,	Sept. 27-28.
Tioga,*	Cowanesque Valley Agricultural Society,	Frank Strong, Westfield,	Westfield,	Sept. 11-15.
Do.	Smythe Park Association,	W. P. Austin, Mansfield,	Mansfield,	Sept. 26-29.
Do.	Tioga County Pomona Grange,	H. Roblyer, Balsam,	Wellsboro',	.....
Union,*	Union County Agricultural Society,	C. Dale Wolfe, Lewisburg,	Lewisburg,	Sept. 19-22.
Venango,*	Venango County Agricultural Society,	James Miller, Franklin,	.....	No fair.
Do.	Oil City Fair and Trotting Association,	J. K. Earp, Oil City,	Oil City,	.....
Warren,*	Warren County Fair Association,	Willis Cowan, Warren,	Warren,	No fair.
Washington,*	Western Pennsylvania Agricultural Association,	J. LeMoynes, Washington,	Washington,	Sept. 26-29.

Do.	Union Agricultural Association,	R. P. Stevenson, S. Burgettstown,	Burgettstown,	Oct. 3-5.
Wayne,*	Wayne County Agricultural Society,	E. W. Gammell, Bethany,	Honesdale,	Oct. 3-5.
Westmoreland,	Westmoreland Agricultural Society,	W. F. Holtzer, Greensburg,	Youngwood,	Sept. 26-28.
Wyoming,*	Wyoming County Agricultural Society,	W. N. Reynolds, Tunkhannock,	Tunkhannock,	Sept. 12-16.
York,*	York County Agricultural Society,	E. Chapin, York,	York,	Oct. 2-4.
Do.	Hanover Agricultural Society,	M. O. Smith, Hanover,	Hanover,	Sept. 26-28.

Note.—Where dates are omitted, no replies to requests for same were received by this Department

THE PENNSYLVANIA STATE POULTRY ASSOCIATION.

OFFICERS FOR 1900.

PRESIDENT.

Norris G. Temple,Pocopson.

VICE PRESIDENT.

A. G. Arnold,Dillsburg.

SECRETARY.

C. T. Cornman,Carlisle.

TREASURER.

G. M. Woods,Leaman Place.

BOARD OF DIRECTORS.

B. F. Ruth,Reading.
J. Emlen Smith,Chestnut Hill.
Wm. H. Kendig,Newville.
M. B. Megargee,Modena.
Walter R. Hibberd,Frazer.

COMMITTEES.

Executive Committee.

Norris G. Temple,Pocopson.
C. T. Cornman,Carlisle.
G. M. Woods,Leaman Place.
And Boards of Directors.

Legislative Committee.

Norris G. Temple,Pocopson.
A. G. Arnold,Dillsburg.

THE PENNSYLVANIA STATE POULTRY ASSOCIATION.

Constitution.

ARTICLE I.

The name of the corporation shall be "The Pennsylvania State Poultry Association."

ARTICLE II.

The object of this corporation shall be to encourage and promote improvement in the breeding and the management of poultry, pigeons and game, and the preservation and protection of the latter, to ascertain by experiment and to collect and disseminate reliable and practical information relating thereto; to work in unison with the State Board of Agriculture, and if possible with all poultry and agricultural societies throughout this State. To recommend competent persons as judges, to furnish advice when called upon and to settle disputes that may occur at poultry shows.

ARTICLE III.

The principal place of business of said corporation shall be in Pocopson, Chester county, with branch offices in Philadelphia, Harrisburg and Carlisle, Pennsylvania.

ARTICLE IV.

The said corporation shall have perpetual existence.

ARTICLE V.

This corporation shall consist of such persons as shall signify in writing their desire to become members and shall pay on application one (\$1) dollar as membership fees and one (\$1) dollar as yearly dues and shall present their application in writing to the secretary, who shall issue a certificate of membership.

ARTICLE VI.

The officers of this corporation shall be a president, first vice president, secretary, treasurer, and five (5) directors (three-fifths of said directors to be practical poultry raisers) and one (1) vice president for

each county, represented by membership in the corporation, who shall be elected by ballot, by a majority vote of the qualified members at the annual meeting, and shall serve one year, or until their successors are elected.

ARTICLE VII.

The annual meeting of the corporation shall be held in the city of Harrisburg on the first Tuesday preceding the fourth Wednesday in January, each year, at such time and place as the executive committee may direct.

ARTICLE VIII.

Any officer or member may be censured, suspended or expelled from the corporation for neglect of duty, unfair dealing, wilful misrepresentation or dishonesty in matters connected with the objects of the corporation, such censure, suspension or expulsion requiring a vote of all the members present at a meeting called for that purpose, thirty (30) days notice in writing having been given each member by the secretary.

ARTICLE IX.

Any member upon the payment of fifteen (\$15) dollars at any one time shall be constituted a life member and shall be exempt from the payment of any further dues.

PENNSYLVANIA DAIRY UNION.

OFFICERS FOR 1900.

PRESIDENT.

A. L. Wales,Corry.

VICE PRESIDENT.

C. L. Peck,Coudersport.

SECRETARY.

Harry Hayward,State College.

TREASURER.

S. F. Barber,Harrisburg.

BOARD OF DIRECTORS.

H. W. Comfort,Fallsington.

Archie Billings,Edinboro.

L. D. May,Bradford.

J. K. Murray,Pottsgrove.

J. C. Sharpless,London Grove.

MINUTES OF THE SECOND ANNUAL MEETING OF THE PENNSYLVANIA DAIRY UNION.

HELD AT WEST CHESTER, PA., DECEMBER 5 AND 6, 1899.

Tuesday Morning, December 5, 1899.

The Pennsylvania Dairy Union met in the Opera House, West Chester, Pa., and was called to order at 10.30.

Burgess C. W. Talbot was introduced and gave the address of welcome, which was responded to on behalf of the Union by J. L. Branson, of Langhorne.

The Secretary made his report as follows:

SECRETARY'S REPORT.

The Pennsylvania Dairy Union was organized March 30th, 1898.

The need of a State Dairy organization had long been felt by many interested in the welfare of the great dairy industry.

Though it has cost time, effort and money to get the organization in working order, upon looking over the results, we can well congratulate ourselves upon what has been accomplished. If we can but grow as rapidly and accomplish as much proportionably in the next ten years as we have in the past year and a half, we shall indeed be a power in the dairy industry of Pennsylvania.

As you all know, our first annual meeting was held last year in Williamsport. Although it was a new departure in its way for Pennsylvania, the meeting was an acknowledged success. While not so largely attended as we could have desired, a keen interest was manifested by those present, and some important work was done.

The oleo question was considered, and it was agreed to secure, if possible, the enactment of a law similar to the one then in force in Wisconsin and Massachusetts.

The measure was heartily endorsed by the State Grange, the Guernsey Breeders' Club, and the Horticultural Association. The matter was put into the hands of a joint legislative committee, and the bill fathered by this association became a law last June.

As expected, the law is not perfect, but it is so much superior to the

law it superseded as to commend itself to the support of all interested.

The bill which resulted in this law was passed almost unanimously by both House and Senate, a fact which encourages us to feel that we can expect any reasonable legislation for which we as a body may ask.

The Dairy exhibit held in connection with our annual meeting was larger than expected, and was an unqualified success. The quality of the exhibit was a credit to our organization, and it is to be hoped that in the near future the Dairy Union will go a step farther in the matter of dairy exhibits and conduct a "year-round" competition, after a plan somewhat similar to the one now in vogue in Denmark.

Later in the year, the Union exerted its influence to prevent the appointment of another Dairy and Food Commissioner in place of our honored Major Wells, who had filled that office for four years so acceptably. In this we also were successful.

It has been one of the objects of your officers to harmonize the various interests connected with our industry, realizing that it is only when all work together that the most can be accomplished for the good of dairying.

So we as representing the dairymen of the State must recognize that the dealers, commission men and ourselves are inter-dependent in many ways. We must also recognize the position of the State Department of Agriculture, for they and we are also in many ways dependent upon each other. It is to be hoped, therefore, that all our members will recognize the importance of the co-operation of all the agricultural interests of the State.

We are, as an association, indebted to Ex-Secretary Edge and to his successor Prof. Hamilton, for the assistance given us in various ways, as well as to the many dairy supply firms for the financial support given us.

Respectfully submitted,

H. HAYWARD,
Secretary.

REPORT OF THE TREASURER FROM MARCH 31, 1898, TO DECEMBER 1,
1899.

Cash received for membership fees and dues, . .	\$348 08
Cash contributed for advertising, etc.,	172 02
Total,	\$520 10
Amount paid for printing bills, circulars, envelopes, stamps, etc.,	\$169 72
Amount paid for prizes, etc., at Williamsport, . .	980 00
7-6-99	

Expense incurred at Williamsport in arranging and holding annual meeting,	139 45
Total,	407 17
Cash on hand,	\$112 93

SPENCER F. BARBER,
Treasurer.

At the close of the treasurer's report the President appointed J. L. Balderston, of Kennett Square, and A. L. Wales, of Corry, auditors.

The President's address was then given, after which the Union adjourned.

Tuesday Afternoon, December 5, 1899.

The Union was called to order and the following papers were read and discussed.

"The Adulteration of Dairy Products," by Prof. C. B. Cochran, State Chemist.

"Our Dairy Laws and their Enforcement," by Major Levi Wells, Dairy and Food Commissioner of the Department of Agriculture.

Major Levi Wells: "I am very glad to be here to-day as evidenced by the fact that I left last night a very interesting Farmers' Institute at my own home and traveled all night and a part of the forenoon to reach this place. You represent the leading agricultural interests of this State with its millions of cows. We have in the State about 1,000 creameries and an estimated annual output of fifty million dollars, and including the real estate, creameries, dairy fixtures and cows, this industry represents capital of not less than two hundred and fifty million dollars. I mention this to show the importance of the interests which you represent. Your secretary asked me to prepare a twenty minute article on the Dairy Laws and their Enforcement."

The nominating committee was announced as follows:

Casper P. Faucett, chairman; A. Billings, George C. Cornell, Professor H. P. Armsby, A. L. Wales.

Adjourned.

Tuesday Evening, December 5, 1899.

The Union convened at 8 P. M., and listened to the reading of the following papers:

"Corporation of Creameries," by F. L. McSparran.

"Modern Methods of Dairy Practice," by Prof. E. B. Voorhees.

Both papers were discussed by members of the Union.

On motion, adjourned.

Wednesday Morning, December 6, 1899.

The Union having been called to order, the reading and discussion of papers was continued.

A paper on "Dairy Education," was read by Dr. H. P. Armsby, of the State College, which was followed by the following papers:

"Wastes of the Dairy," by R. A. Pearson, Assistant Chief of Dairy Division, U. S. Department of Agriculture, Washington, D. C.

"Cow Feeds," by W. C. Embree.

"Our Stables," by Dr. Leonard Pearson, State Veterinarian.

Henry Marshall was appointed by the President one of the auditors of treasurer's accounts in the place of John Balderston.

On motion, adjourned.

Wednesday Afternoon, December 6, 1899.

The meeting was called to order by the President, and the programme was continued as follows:

"The Economy of Raising Calves to Replenish the Dairy," by J. C. Truman.

"Dairy Matters" was the next paper, read by Geo. A. Smith, after which the following resolution was read by George Maloney:

Mr. George Maloney: I was much interested in the reference in Mr. Smith's paper to the cheese market; we are all agreed that the Department of Agriculture made some vigorous efforts to open a market abroad, which efforts have been successful in developing a demand abroad for good American butter; and in this connection I would like to offer the following resolution:

Resolved by the Dairy Union of Pennsylvania in annual convention assembled, That we heartily endorse the efforts of the United States Department of Agriculture to enlarge the foreign markets for our dairy produce, and we respectfully urge the adoption by Congress of the recommendation of the Secretary of Agriculture that the present provisions for the inspection of meats for export be extended to dairy products.

The resolution was amended by the insertion of the words after assembled, "at West Chester on the 5th and 6th of December, 1899,"

111111

NATURE STUDY.

Professor John Hamilton: The experience of many of us in preliminary education, if taken, would no doubt be an exact corroboration of the experience of Professor Roberts. I was a grown man before I knew how a butterfly came to be. We knew what a birch rod was because it grew in our neighborhood, and they were in operation in our school, but no attempt was made to give us instruction in the natural objects about us. It has been demonstrated now that it is perfectly practicable to give instruction to the smallest children in regard to matters that relate to natural things. At Cornell and Lafayette they have a course of study for teachers in the public schools, and have given invitations to teachers to come to Cornell and receive instruction in the study of nature as they are able to give it at that institution. There has been a great deal of progress made, and the country children are being informed of those things with which they have to do. In Canada they have introduced into their public schools the study of agriculture. Manitoba, Nova Scotia and New Brunswick have done the same. I should like to offer the following resolution in regard to this State:

"Inasmuch as children should be informed in regard to the natural objects which surround them, and inasmuch as there is no place where this information can be acquired by the majority of those whose homes are in the country except in the country schools, therefore,

"Resolved, That we, members of the Pennsylvania Dairy Union, recommend that the study of nature be introduced into the schools in this State, and that a copy of this resolution be forwarded to the Superintendent of Public Instruction of the Public Schools of Pennsylvania."

The resolution was seconded by A. L. Wales, of Corry, and carried.

Mr. Embree: Is the resolution for the study of natural science or of natural science as applied to agriculture?

Professor Hamilton: The purpose is to give instruction in regard to natural objects in the neighborhood in which the children live; and it means that the children shall be taught by this course of instruction and given information in regard to the various things about them.

Mr. Joshua Jeffries: I have heard nothing for years in an meeting of this kind that has given me so much pleasure as the resolution announced by Professor John Hamilton. It is a subject which I advocated more than 25 years ago, and I know of nothing more beneficial than for the teacher to take an hour or half an hour in the course of study, and there take up some such study while the brain is receptive, and when ideas taken into it shall be retained through life,

Report of the Committee on Nominations:

President, A. L. Wales, of Corry, Pa.

Vice President, C. S. Peck, Coudersport.

Secretary, Harry Hayward, State College.

Treasurer, Thomas Sharpless, West Chester.

DIRECTORS.

H. W. Comfort, Fallsington.

Archie Billings, Edinboro.

L. D. May, Granville Centre.

J. K. Murray, Pottsgrove.

Joseph C. Sharpless, Londongrove.

W. C. Norton, Aldenville.

Corry, Pa., was selected as the next place of meeting.

Thomas Sharpless, who was nominated for treasurer, urged that as Mr. Barber was a good treasurer, and every one knew his address, he thought it a mistake to change the officer. The proposition was accepted, and Mr. Barber expressed his willingness to retain the position.

A. L. Wales, the newly-elected president was asked to take the chair, but he thought it was scarcely right "to crowd a new man in before he had time to catch his breath." He thanked the Union for the honor, and hoped to see next year every member from this end of the State.

The auditing committee reported that they had examined the accounts of the treasurer and found them to be correct. Balance on hand, \$112.93.

The following papers were then read, viz:

"What Science has Done to Develop the Dairy Industry," by Prof. I. P. Roberts.

"The Requirements of An Up-to-Date Butter Maker," by Geo. C. Cornell.

The subject of the next paper was then announced: "Handy Devices for Farm Uses," by Archie Billings.

Mr. Billings proposed owing to the lateness of the hour that his paper be dropped from the programme; but it was voted that the paper be read.

REPORT OF BUTTER SCORE.

Three prominent commission men, of Philadelphia, who did not know whose goods they were handling, inspected the samples of butter and cheese on exhibition at the Tattersall yesterday. They applied the commercial methods such as they are in the habit of using every day, and to the credit of the exhibition be it said, the results are fine. Better showing is made than the dealers expect from the fancy prints.

OFFICIAL AWARDS.

The official awards are as follows:

In Division A, Class 1, Creamery Tubs.—Robert Hamill, of Cochranville, won first prize, \$25 and diploma. L. D. May, of Granville Centre, second prize, \$15, and diploma. J. W. Waite, of Smithport, third prize, \$10.

Division A, Class 2, Dairy Tubs.—Austin Leonard, Troy, Pa., gets first prize, \$25 and Dairy Union diploma. S. M. Leonard, Granville Centre, gets second prize, \$15, and Dairy Union diploma.

Division A, Class 3, Creamery Prints—State College, State College, Pa., first \$25 and diploma. B. A. Burnham, West Chester, Pa., second, \$15 and diploma. S. L. Byler, Bird-in-Hand, Lancaster county, Pa., third, \$10. The Creamery Association, of Eastern Pennsylvania adds a special premium in this class. \$12 to the first prize, \$8 to the second, \$5 to the third.

Division A, Class 4, Dairy Prints.—Benj. Sharpless, West Chester, Pa., first, \$25 and diploma. Walter Michiner, Glen Hall, Chester county, second, \$15 and diploma. Thomas Sharpless, West Chester, third, \$10.

Class B, Cheese, E. A. Bean, first prize, \$25.

It will be seen that all the premiums for dairy prints remain in Chester county, though there were several competitors from over the State. In creamery prints the first prize is captured by State College, where every opportunity is afforded for producing the best possible article, while the second goes to Mr. Burnham, who operates the plant in East Bradford owned by Dr. Jacob Price.

Following are the official scores and the high compliment paid by the judges:

Name.	Flavor, 4s.	Grain, 30.	Salt, 10.	Color, 10.	Appearance, 5.	Total, 100.
Division A, Class 1—Creamery Tubs.						
Austonville Cr. Co., Columbia X-Roads,	38	29	9	10	5	91
C. W. Eckman, Millville,	40	28	6	10	5	89
J. W. Walte, Smithport,	40	29	10	10	5	94
John I. Carter & Sons, Chatham,	40	28	10	10	5	93
J. G. Relst, Mt. Joy,	39	28	10	10	5	92
Robert Hamill, Cochranville,	43	29	10	10	5	97
Geo. Faucett & Sons, West Chester,	40	28	10	10	5	93
S. D. May, Granville Centre,	41	29	10	10	5	95
F. G. Thomas, Cheyney,	35	28	10	10	5	88
Division A, Class 2—Dairy Tubs.*						
Austin Leonard, Troy, Pa.,	38	28	10	10	5	91
L. M. Leonard, Granville Centre,	33	28	7	8	5	81
Division A, Class 3, Creamery Prints.						
L. M. Leonard, Granville Centre,	30	28	6m	7	4	75
Austonville Cr. Co., Columbia X-Roads,	38	29	10	10	5	92
E. W. Eckman, Millville,	40	27	5m	10	5	87
J. W. Walte, Smithport,	40	29½	10	10	5	94½
Ed. A. Pugh, Oxford,	38	29	10	10	5	92
Austin Leonard, Troy,	35	28	6m	10	5	84
John I. Carter & Sons, Chatham,	40	29	10	10	5	94
Thos. K. Moyer, Blooming Glen,	38	29	10	10	5	92
Cold Spring Creamery Co., State Hill,	38	29	10	10	5	92
State College Dairy, State College,	44	29	10	10	5	98
Fountdale Creamery Co., Fayetteville,	38	27	10	10	5	90
Burt. A. Burnham, West Chester,	42	29	10	10	5	96
J. G. Relst, Mt. Joy,	38	25	10	10	5	87
Garber, Relst & Co., Lititz,	40	29	10	10	5	94
Robert Hamill, Cochranville,	40	28	10	10	5	93
Jacob F. Klatz, Mt. Bethel,	34	29	10	10	5	84
West Chester Dairy, West Chester,	40	28	9½	10	5	92½
Geo. Faucett & Sons, West Chester,	41	28	10	10	5	95
S. L. Byler, Bird-in-Hand,	41½	29	10	10	5	95½
L. D. May, Manager, Granville Centre,	40	29	10	9½	5	93½
J. H. Schrack, Wagontown,	39	29	10	10	5	93
L. D. Mickley, Cherryville,	37	29	10	10	5	91
Knight Bros., Leatherwood,	40	28	10	10	5	93
F. G. Thomas, Cheyney,	35	28	10	10	5	88
A. C. Baldwin & Bro., Cains,	39	27	10	10	5	91
Division A, Class 4—Dairy Prints.						
J. L. Mitchell, West Chester,	38	28	10	10	5	91
Thomas Sharpless, West Chester,	40	29	10	9	5	93
Ed. T. Ingram, West Chester,	37	28	10	10	5	90
Edward Walter, West Chester,	35	28	9	9	5	88
Walter Michiner, Glen Hall,	40½	28	10	10	5	93½
Benjamin Sharpless, West Chester,	42	28	10	9	5	94
George Forsythe, West Chester,	39	28	10	10	5	92
J. K. Murray, Pottsgrove,	35	28	8	9	5	85
S. N. Hill, Jr., Markham,	30	20	8	8	3	69
John H. Lemon, Warrior's Mark,	38	28	10	10	5	90
Cheese.						
E. A. Bean, Knoxville,	43	29	15	10	.....	97

*In this class there were but two entries. The first prize consists of \$25 and Dairy Union Diploma. Second prize is \$15 and Dairy Union Diploma.

The finest line of butter we have ever scored at this season.

W. D. EDSON,
JOHN S. MORRIS,
EDW. S. STACKHOUSE,
Scorers.

ENFORCEMENT OF THE OLEOMARGARINE LAW.

Mr. Thomas Sharpless: This Dairy Union is primarily, of course, for the betterment of our dairies, for the raising of better cows, better manner of feeding them, etc. There is another question in which we are vitally interested, and that is the enforcement of our oleomargarine law; and the question has arisen whether it might not be advisable to appoint a committee to look after the committee up in Harrisburg, and to furnish any evidence that might come in their line. Current report tells us that such and such persons are violating the law.

Mr. W. G. Embree: Without any desire to cast any reflection on the Department, it seems to me that as the Dairy Union framed that law, it is in a measure responsible for it and for its execution. I think if the Department understood the spirit of this matter they would not think of any reflection in connection with it. As was said yesterday, there has been an impression that the Department was not doing what had been expected. If that is groundless, as I think it is, it would be to the interest of the committee to communicate with the Department and keep them informed of any infringement of the law. I think we would have the Dairy Union in communication with the Department of Agriculture in a manner satisfactory to both. This would prevent wrong impressions in regard to the Department and probably would be a benefit in securing enforcement of the law.

Professor John Hamilton: The Department of Agriculture has been trying in its way to carry out the provisions of all of the laws that are put under its control, and it takes responsibility for their execution. If any gentleman here knows of any case in which the Department has failed to do its duty I wish he would say so and specify it. If any gentleman here has given the Department testimony of violation of law that the Department has not followed up, I wish he would say so. It is very easy to get an impression, and an impression is a very vague thing. The "they say" is a very intangible sort of an individual. But if any one has any item to show that the Department has not carried out the provisions of the law entrusted to it, I wish he would give it. We get information from people throughout the State who suppose that the law is being violated; we send men to investigate, and often find that they were mistaken. We want to have evidence and there will be no case presented before the Department of Agriculture, accompanied with proper evidence, that will not be followed up and the case brought into the court. You have an executive committee which is a standing committee, and can co-operate with the Department of Agriculture at any time, and if the Department of Agriculture does not do its full duty, then it seems to me something can be done. But for a

vague impression, that reflects upon the Department, to be taken as truth and considered seriously, is I think a mistake. The Department of Agriculture is trying to do its duty. It has not arrested every violator of the law, but a great many have been arrested and many dollars in fines have been paid into the Treasury. I think it is a mistake to pass any such resolution as this.

Professor Hayward: As secretary of the Pennsylvania Dairy Union I have tried to secure evidence in black and white of instances in which the Department has not done its duty, with the understanding that I would present it to the Department and secure satisfaction, and I have failed to secure any such evidence. I, myself, have not the least doubt but that the Department will do everything in its power to enforce the law. I think we as an organization should stand together, and not cast reflections when we cannot lay the finger upon anything of which we are sure.

Mr. Thomas Sharpless: I would like to ask that if I informed the Department that I believed a certain party was violating the oleo-margarine law, whether they would put detectives on his track and find out whether such was the case.

Professor Hamilton: We should expect some evidence would accompany the request and the assurance that you would be a willing witness in case we came into Court. Then we would investigate every case.

Mr. Thomas Sharpless: I think Professor Hamilton has misunderstood my remarks. I did not mean any reflection on the Department, except that the Department has not enforced the law. I did not mean to cast any reflection upon Professor Hamilton, and do not now, and propose from what has been said not to discuss the subject any further. I think it is still well for the Association to keep a lookout for the violators of the law.

Dr. Price: It would seem that if the Department is doing its duty it would be anxious to have the appointment of such a committee. The object of the committee is rather to co-operate with them. I certainly hope it will be appointed.

President *pro tem.* Would it be satisfactory if the matter were left as Professor Hamilton has suggested, with the executive committee?

Mr. Thomas Sharpless: The object is not to reflect upon the Department, but that this committee should be a means of dissipating these vague impressions without foundation, and be an assistant and not a critic. I say again that I think Professor Hamilton has misunderstood the spirit of the suggestion.

Professor Hamilton: I do not know that anything further need be said by me, except that the books of the Department are open to anybody who has an impression that there is anything wrong.

Mr. Brant: Why need there be a resolution when the executive committee of this Association can assist the Department without any resolution? I move that the executive committee be authorized to act as auxiliary to the State Department to aid in any way possible in furnishing evidence, or in aiding in the arrest of any one violating the law. I move that the executive committee be authorized to act in conjunction with the State Department. The motion was adopted.

Adjourned.

PAPERS READ AT THE ANNUAL MEETINGS

OF THE

STATE HORTICULTURAL ASSOCIATION

OF PENNSYLVANIA,

HELD AT

Lancaster, Penn'a., January 18 and 19, 1898, and Harrisburg, Penn'a.,
January 18 and 19, 1899.



STATE HORTICULTURAL ASSOCIATION OF PENNSYLVANIA.

PAPERS READ AT ANNUAL MEETING JANUARY 18 AND 19,
1898.

REPORT OF GENERAL FRUIT COMMITTEE.

BY P. C. HILLER, *Chairman.*

Your chairman of the General Fruit Committee would respectfully report having received full reports from nearly every district in the State.

The very intelligent replies received from painstaking and observing correspondents deserve great credit for their prompt and satisfactory replies to the questions of the committee, sent out on the 11th day of December last, after all work of orchard and garden was completed for the season.

From correspondence received by your chairman, the following details have been gleaned.

APPLES.

The apple crop was a very light one in nearly every section of the State.

Berks county.—Crop below the average. York Imperial best.

Lancaster county.—Poor in quantity and in quality. Cause, exceeding drouth and humidity of the atmosphere at time of ripening.

Montour county.—Yield and quality good, but fruit not keeping.

Union county.—Smith's Cider, York Imperial and Delaware Red bore good crops and keep fairly well.

Cumberland county.—One-half crop. Do not keep.

Lehigh county.—Seventy per cent. of a crop. Sprayed fruit keeping fairly well; unsprayed was scabby and do not keep.

Perry county.—Good crop and keeping well.

Pike and Westmoreland counties.—About a half crop, poor in quality.

Northampton county.—Smith's Cider the chief crop and keeping well; all other varieties poor.

Potter county.—Nearly a failure, quality poor; keeping very well, but hardly worth keeping; very wormy.

Lebanon county.—Yield fifty per cent. Quality eighty per cent. York Imperial keeping well.

Northumberland county.—Yield small, quality poor and do not keep.

York county.—Light crop. Where the orchards were not sprayed, fruit dropped badly and not keeping.

Beaver county.—Failure.

Schuylkill county.—Yield about thirty per cent., quality seventy-five per cent., keeping fifty per cent.

Cumberland.—Summer and fall apples medium. Winter one-third of a crop and faulty.

Adams county.—Yield very good, quality fine, where sprayed. Crop mostly sold to buyers direct from the orchards. Those on hand not keeping well.

Snyder county.—Short crop, quality good, keeping poorly.

Dauphin county.—Generally a failure.

Bradford county.—Light crop as a whole, quality very good, not keeping.

Wayne county.—Yield one-fifth of last year; one-half an average crop; fruit small, irregular, wormy, premature ripe and not keeping. Bulk of crop was sold as gathered at \$1.25 per barrel for the best of them, delivered at depot.

Luzerne county.—Some orchards yielded very well, and fair in quality; others light, with fruit illy shaped; summer and fall varieties rotted badly. Of the winter varieties, Northern Spy rotted most.

Franklin county.—Yield good, quality good as to many of the popular varieties as Baldwin, Ben Davis and the Yorks. Finer varieties not so good; affected badly by leaf blight that followed wet weather at blossoming time. Grimes Golden, all right.

Chester county.—Yield light, excepting Summer Hagloe. Winter varieties fell prematurely, and though sprayed three times, there was much imperfect fruit.

Bucks county.—Crop light, medium in quality and not keeping.

The same conditions existed in Tioga county.

Lawrence and Clarion counties.—Total failure on account of May frosts.

Delaware county.—Small yield, poor quality and not keeping. The crop ripened too early, a common fault in this section.

Somerset and Allegheny counties both report less than one-sixth of a crop, and very inferior in quality; cause, extraordinarily large crop of the previous year.

Philadelphia county.—A failure.

Susquehanna, McKean, Armstrong, Crawford, Forest, Elk, Juniata, Indiana and Mercer counties all report poor crops.

Bedford, Carbon and Wyoming counties fair ones, and fair in quality.

Clearfield, Clinton and Centre counties report good large crops; good in quality, but not keeping.

Green and Huntingdon counties.—Poor crop and not keeping.

PEARS.

The crop was considerably below the average in quantity. Fruit was marketed in fair condition and somewhat better prices were realized than last year. Delaware, Susquehanna, Chester, York, Lebanon, Lackawanna, Montgomery and Lancaster counties report large yield of fairly good quality. In Warren, Philadelphia, Cumberland, Northumberland, Potter, Montour and Berks the crop was a fair one. Center, Mercer, Clinton, Indiana, Elk, Forest, Clearfield, Bedford, Armstrong, McKean, Bucks and Huntingdon report light to very light crops. In Carbon, Wyoming and Juniata, fair. Crawford, good.

Blight affected the pear in nearly all the counties, and was especially bad in Susquehanna, Berks, Clarion, Chester, Wayne, Bradford, Snyder, Schuylkill, Beaver, Northumberland, Lebanon, Potter, Northampton, Westmoreland, Lackawanna, Pike and Lancaster counties. Reports from some of the above named counties state that people are leaving blight take its own course. Spraying appears not to have been tried during the year to any great extent on pear trees. As to best varieties, reports are to the effect that Kieffer, Bartlett, Lawrence and Seckel, did best in the order named.

PEACHES.

The year 1897 was more than an ordinary year for peaches, as to quantity. Owing to the heavy crop, the fruit, generally, was under size, many trees being allowed to break down under their load of fruit, and for the same reason the quality was not up to the standard. Where properly thinned, fruit was larger and better. Comparatively few counties report a failure in the crop. In the reports there was less complaint of yellows, with a very few exceptions, than usual. Prices were fair, and in many cases very good. On the whole the crop was the heaviest we have had in a number of years.

PLUMS.

This fruit is being more generally planted than it has been for a number of years, owing perhaps largely to the introduction of the Japan varieties, which appear to continue coming up to expectations,

Lombard still continues to be a popular European variety. Abundance, Burbank, Ogon and Willard are very highly spoken of by nearly all who grow them. In Lancaster county, a native variety belonging to the prune family, bore immense crops and were sold at retail as low as $2\frac{1}{2}$ cents per quart. The Japan varieties brought 8 to 10 cents. Rot was reported as being bad in some sections, while others had none. Where properly sprayed, little trouble was experienced in this direction.

CHERRIES.

The reports in regard to cherries varied very much. In some localities the crop was a failure, in others the yield was heavy. In my own native village (Conestoga Centre) there were sold over 6,000 quarts at an average of seven cents per quart. Leaf rust, aphid, mildew, rot and curculio combined, played sad havoc with trees and fruit in different sections, and many of the trees either died outright or were so badly crippled that they will no longer be profitable. Early Richmond and Large Montmorency are the leading sour varieties. Among the sweets we find the most popular ones to be Gov. Wood, Black Tartarian, Windsor, Conestoga, Lancaster, Early Purple, Giugne and Great Bigarreau.

QUINCES.

Where careful attention was given to pruning, spraying and keeping out borers, this crop was a fairly good one. Crawford, Lawrence and Delaware counties report excellent crops of fair quality. Centre and Clinton, heavy crops of medium quality and not as perfect as usual. In many counties they are not grown at all for market purposes. Less complaint of leaf blight, than usual. All agree that only those who systematically sprayed succeeded in producing fine fruit.

GRAPES.

The yield was below the average. Early frosts, hail and rot, did considerable damage in many sections. Where sprayed and bagged, they did fairly well. The best reports as to varieties came from the Concord, Worden, Niagara, Moore's Diamond, Brighton, Eaton and Wilder.

SMALL FRUITS.

Strawberry crop was a fair average one throughout the State. Some counties had very heavy crops. Prices, as a rule, were fair.

Raspberries were a heavy crop, though in some sections the dry weather shortened the ripening season. The blackberry crop was pretty generally a heavy one. Currants and gooseberries were a fair crop. Of strawberries, the following newer varieties appear to be taking the lead, in the order named: Bubach, Greenville, Brandy-

wine, Marshall and Wm. Belt. Among the newer raspberries, Loudon, Miller Red and Kansas are highly spoken of, yet pretty nearly all agree that no red raspberry has been introduced of late years that succeeds and sells better than the Cuthbert.

VEGETABLES.

Potatoes as a general rule proved to be a short crop throughout the State. The season has been reported as favorable to the growth of nearly all other vegetables, more especially so in the early part of the season.

SHRUBBERY—PLANTS AND FLOWERS.

There appears from the reports received from nearly all sections, that very considerable progress is being made in this direction.

New plants are eagerly sought for and our lady friends are paying more attention to having windows decorated with rare plants and flowers during the winter months, and in the summer they are more frequently found in the gardens and house yards, among their tulips, crocus, lilies, roses, etc., etc., and later, the chrysanthemums, each apparently trying to outdo their neighbor, in a quiet way, thus showing a largely increasing interest in floriculture. Here let us remark, that we believe the great railroad companies of our Commonwealth are setting our people an excellent example, from the lavish expenditure of money in beautifying the grounds about every station along their lines, and thus stimulating the tastes of our people and spurring them to greater activity in beautifying our homes.

GENERAL OBSERVATIONS.

The general observations as to successful experiences of this year as in the past may be summed up in a very few words. We can not raise sound and perfect fruit without systematic spraying. Fertilization, cultivation and pruning are very necessary, but they alone will not be successful. Insects and the various diseases to which our fruits and fruit trees are subject must be fought and conquered. We believe that the time is not far distant, unless some unforeseen event takes place, that fruit growing must not only be made a special but a separate business. In the spring and early summer our farmers are kept too busy with their farm work to attend to their fruit trees, and will eventually depend on us to supply their wants, as well as to supply the wants of those who live in cities and towns. We can not farm and grow fruit successfully at one and the same time with the same number of hands that would be required to run the farm alone.

Many members of the committee report a very large number of trees attacked by blight during the summer, especially among the pear. No new remedy appears to have been discovered. It can be

checked for a time, but apparently not prevented. Peach yellows still continues to cut short the life of the peach trees. San José Scale does not appear to be spreading to any alarming extent, as only a few members of the committee report its existence, and after all, the danger may not be as serious as we apprehended a year or two ago. Let us hope not. Hail and early frosts did their share of damage in many places. On the whole, with the exception of apples, the fruit crop of Pennsylvania was a more profitable one than we have had in a number of years, owing largely to better prices for the careful grower, rather than in increased quantity. Within comparatively a few years, quite a number of persons in south eastern Pennsylvania are successfully growing cantaloupes and watermelons. The former, in a season like the one we have just passed through, will yield from \$100 to \$150 per acre, and the latter nearly as much. In Conestoga township, Lancaster county, there were grown last season about 40 acres of cantaloupes.

Nut culture is still on the increase. Last year the crop in our county was nearly a failure. Quite a number of acres of sprout land was grafted to Paragon last year, and a contract is now under headway for the grafting of 2,500 trees on one farm this coming spring. Paragon does best and sells best, bringing from 20 to 25 cents per quart.

Committeeman J. Donaldson, of Armstrong county, writes: "Owing to continued cold and wet weather at the time fruit was in blossom and when fruit was forming, caused somewhat of a failure. Until then we never had a larger or better show for a good crop."

W. Fulmer, of Allegheny county, says: "Taking it as a whole, this has been the worst season in many years for quantity and quality. Leaf blight on pear, apple and quince is getting worse every year. Unless spraying is more generally done, better results can not be expected."

C. L. Longsdorf, of Adams county, says: "Our county has made rapid strides toward becoming a leading grower of apples. Large orchards have been planted this fall and many more will be planted in the spring. I regret very much to have to report the presence of San José Scale in two of the largest orchards, or rather farms, especially on trees near the buildings, on stock brought from one of the leading nurseries of New Jersey. Would suggest that this Association take prompt action in having stringent laws enacted to protect us from nurserymen in other States who are shipping into our State stock which they know to be infected." Of new fruits he writes: "The Wickson plum is in every way satisfactory, being an early and abundant bearer. The Wilder pear is, to my mind, a first class choke pear. I may change my mind later about this variety, but until I know more in its favor I shall not do so."

J. V. Garrettson, also of Adams county, says: "The season in this county favored the growth of some varieties of apples, such as York Imperial, York Stripe, Ben Davis, Baldwin; but spraying was not a success, owing to wet weather. Brandywine strawberry did not measure up to expectations. Greenville did best of all. Cultivated chestnuts were fine. Paragon, Numbo and some Japan seedlings. Japan plums promise well, especially Abundance, Burbank and Wickson, the latter very fine. Newer varieties of grapes did not succeed, being injured by frosts of Spring. San José Scale is giving some trouble in the county. Seems hard to remedy."

H. W. Comfort, of Bucks county, says: Pear buds were killed in April by a freeze. Small fruit culture yearly receives more attention. Currants pay well, so do the sour cherries."

W. H. Moon, ex-President, also of Bucks county, reports general fruit crop light, except peaches, which were an immense crop of very inferior fruit.

Oliver D. Schock, of Berks county (northern district) says: "The crop of plums was phenomenally large where trees were sprayed. Peach trees suffered serious damage by reason of the owners failing to thin the crop. I experimented with several grafts of Japan Golden Russet pear. One graft on a Kieffer tree, placed in position in the spring of 1896 produced twenty-eight fine pears. They presented a beautiful appearance. Quality not equal to Bartlett. I am of the opinion that the pollen of it intermingling with that of the Kieffer is of decided value to the latter. I visited Mr. B. F. Cocklin's famous peach orchards in York county, where several hundred dollars had been expended in thinning the fruit. This investment not only saved the trees from destruction by reason of being overburdened, but the excellent quality of the large crop picked compensated for the cost of thinning more than five fold."

E. M. Berry, also of Berks county, says: "Results were fair. Stringency of the times does not appear to lessen the desire for beautifying homes."

S. S. Diehl, of Bedford county, says: "The best crop of raspberries and blackberries I have ever known. Good crops of all varieties of fruits, excepting apples and pears."

R. M. Wells, of Bradford county, reports the past season as one favorable for all kinds of fruits. "Pear and apple trees blighted pretty considerably. I have never known plant lice to be so abundant. Yellow aphid, upon currants, were especially bad, and found it difficult to do anything to check them. Kerosene emulsion, even when branches were immersed in it, seemed to fail. In a neighbor's garden, Red Dutch were almost free, while Fay's Prolific were badly infected. Upon a Chabot Plum there were two varieties, a purple one that clustered around the buds and a black one upon the leaves. In using

kerosene emulsion the leaves were frequently destroyed, and I had to resort to crushing, rubbing and brushing the insects in the battle. The leaves curled so badly that spraying would not reach them. No San José Scale in this county up to this time."

A. L. McKibben, of Beaver county, says: "Fruit in our county was almost an entire failure, more generally so than has ever occurred before. Cold rains in May had perhaps more to do with the failure than late frosts. August, September and October were very dry months, thus cutting short all vegetable crops. Owing to dry weather, insects played sad havoc with young fruit trees. Blight destroyed whole pear orchards. I lost all my Barlett, Clapp's Favorite and Flemish Beauty."

J. Hibbard Bartram, our worthy treasurer from Chester county, says: "Apples were a light crop, excepting Summer Hagloe, and though sprayed three times, had much imperfect fruit. Gandy strawberry did the best on my grounds. Think well of Leader. I tried about a dozen new varieties, but have none to recommend. Saunders and Lovett are tremendous bearers, but not satisfactory sellers."

W. H. Brinton, ex-secretary, of Chester county, writes: "Pears good, but trees somewhat affected by blight. Japan plums taking the lead. Richmond and Montmorency cherries the best for market purposes. Niagara grapes especially fine. A growing fondness for planting shrubbery, plants and flowers, especially where finances permit."

John W. Thomas, also of Chester county, says: "I attribute the failure of vegetable growth to extremes in conditions of the weather. Fruit supply was above the average, fair and generally good in quality, resulting largely from the use of the spraying machine. Our small peach orchard produced between 3,000 and 4,000 baskets of peaches, and would have done better, but for the severe storms breaking the trees. On the whole, the year may be counted one of fair success."

J. W. Pyle, also of Chester county, writes: "We had a pretty general crop of fruit except pears. Bartlett and Kieffer were the only varieties that did well. This part of Chester county never had such universally good crops of everything. Early asparagus was cut by frost, and cold weather gave us rather short crop, but better prices. Strawberry crop rather short. The season of 1896 was too dry to grow good strawberry plantations for 1897 fruiting. Sharpless still continues popular with those having a clay sub-soil. Brandywine is good in quality, large and productive, but does not take the eye in the market. Bubach seems to be the most popular. Gandy did exceedingly well. Greenville, if well fertilized is fine. Raspberry crop, good. Souhegan, Eureka and Kansas for black; Miller Red and Cuthbert are best; Columbian promises well. Immense crop of currants,

especially Victoria, Fay's and Versailles. Prices ruled low. Triumph and Downing gooseberry did well. We believe the Pearl will be a valuable variety. Cherries a fair crop of nice fruit. Blackberries a good crop. Erie and Lawton the best. More rot in grapes than we ever noticed, even affecting Concord. Japan plums good, especially where sprayed with Paris Green, and sold readily at \$2.50 per bushel in the orchard. Peach trees overbore. One grower sold 1,500 baskets, from 700 trees, at an average of 62 cents per basket. Another sold \$220 worth from 200 trees. Chestnut crop was very light."

D. E. Longsdorf, of Cumberland county, reports a full crop of fruit, excepting apples, pears and quinces. Perfect bunches of grapes were obtained only by bagging. He also states that he fruited a new seedling peach, large as Susquehanna, much better in flavor and a good bearer.

Henry S. Rupp, of Cumberland county, says: "Pears, peaches, plums, grapes, cherries and small fruits were abundant and excellent in quality and brought fair prices. No particular rush in this county for shrubbery. San José Scale exists in the upper end of the county, notably in one orchard to such an extent that the owner could not get a purchaser for it at public sale. I think this Association should make a move to have stringent laws passed to prevent its spread." Mr. Rupp was one of the first to respond to questions of the committee. He died Saturday, January 15, at 6 A. M., and was buried yesterday.

E. Bauer, of Carbon county, says: "We had a middling good crop of apples, of good quality and keeping well. Nectarines do better than plums. All other crops good."

James Turner of Crawford county, reports blight on pear as being bad. Lombard plum and German prunes abundant. Too wet for vegetables. Light crop of small fruit.

Samuel Hall, of Clearfield county, says: "Generally speaking, the season was unfavorable. Cold, backward spring and very wet during latter part of June and in July the cause."

Prof. Geo. C. Butz, Professor of Horticulture at the Pennsylvania State College, Centre county, writes: "Anthracose prevalent in grapes and aphid on cherry trees. Blight serious in pears. Large yield of apples of good quality and keeping well. Regrets being absent from his office so much that he can not refer to his record books for a better report on varieties, and especially on novelties."

J. A. Herr, of Clinton county, says: "I noticed the importance of planting different varieties of plums together that fertilization of blossom may be the better induced."

Wm. Shangfelt of Clarion county, says: "Season was favorable for vegetables, rather unfavorable for fruits. Blight killed quite a number of pear trees."

E. C. Brinser, of Dauphin county, says: "The season was favorable for most fruit. Cumberland strawberry blighted so badly that scarcely any fruit came to perfection. Columbian raspberry is great for growth and productiveness, but I do not need a ladder to pick them, and unless the quality improves, I see no reason why it should have a place on the list. Loudon may be good, but not equal to Cuthbert. Lovett's Best Blackberry is very fine, but seems to have a bad fault, viz: A good many of the plants produce no fruit while others in the same locality are loaded. In strawberries I am satisfied that we have nothing to compete with Bubach, a good seller, sure bearer, but not of finest quality. I also want to sound a word of praise for the Kansas raspberry. In peach we have I think two valuable acquisitions, Elberta and Fox's Seedling. I wish some one could suggest a remedy to stop the ravages of grub worms in young strawberry beds."

Jos. H. Paschall of Delaware county, says: "Apple and grapes were a partial failure. All other fruits abundant and good in quality. Quinces are a never failing crop when sprayed with Bordeaux mixture. Greenville strawberry very fine. Ancient Briton blackberry, no good."

W. H. Johnson, of Elk county, says: "In our county we depend largely upon wild small fruits, which were very plentiful."

C. A. Randall, of Forest county, says: "Small fruit crops were good. The season as a whole was very unprofitable for fruit growers. Early and late frosts and too much rain in the early part of the season."

C. W. Good, of Franklin county, writes: "A hail storm crossed my section from South-west to North-east, which cut the grapes badly, and rot and mildew assisted the demolition of the injured ones. Hail also did some damage to vegetables. To the credit of the hail storm be it said a threatened plague of caterpillars was completely annihilated. All told, the season was a good one. I would not like to say too many good things, for fear you will charge me with boasting. All we need is remuneration for our outlay and labor. We are handicapped by cheap land and labor south of us, not (in a business point of view) unlike the iron, cotton and other manufactures, that must move south or shut up."

N. Seanor, of Indiana county, says: "We had a late frost that affected apple, cherry and peaches. Blight destroyed a large number of pear trees."

J. E. Jamison, of Juniata county, says: "The past year has been one of profit to the successful fruit grower, with the exception of apples. My Kieffer pears brought me more clean cash than any other variety. If you wish to grow pears successfully, spray well and often. Another year's experience has convinced me that there is money in peaches in the Juniata Valley, notwithstanding the past season has

been the worst for yellows in the history of the valley. If Japan plums prove as good in the future as in the past, they certainly are a valuable acquisition. Lombard and Richland are good, but Abundance beats them all. Shrubbery, etc., is receiving more attention each year. Lastly, if you want more and finer fruit use the sprayer. Spray early and often. Careful and judicious spraying will kill codling moth, prevent rot in grapes, kill caterpillars, prevent, to a great extent, leaf blight, and acts like a charm on vermin that infest poultry houses."

Samuel McCreary, of Lawrence county, says: "We had a number of hard frosts in May, and afterwards cold and dry weather until about July 18, when it began to rain, and kept wet into the month of August, causing wheat to sprout in shock and stalk. Never had as near a failure in apple as we had this season."

P. Sutton, of Luzerne county, says: "A sort of slug defoliated cherry trees generally. Strawberries yielded well, but prices were low. Celery blighted badly. Quinces yielded fairly, but rotted badly on some trees."

Henry C. Snavelly, of Lebanon county, writes: "Peach crop was the finest ever raised. Considerable yellows, and as bad in rich as in poor land. A large yield of pears. Some blight and leaf rust. Fungous diseases more prevalent during the past summer than usual, as was also the case with codling moth. Spraying with arsenites and Bordeaux mixture less effective than usual. The very hot weather, during the fall, hastening ripening, the cause of fruit not keeping well."

H. W. Northrup, of Lackawanna county, says: "With the exception of apples, the fruit crop was plentiful and fine. Good crop of vegetables, excepting potatoes. Onions very fine."

W. B. K. Johnson, of Lehigh county, presented an interesting report as to yield, quality, etc: "Sprayed apples keep fairly well. Peaches were a fair crop and good in quality, bringing from \$1 to \$1.50 per basket. In cherries, Montmorency, Yellow Spanish, Black Tartarian, Gov. Wood, Elkhorn and Belle Magnifique did the best. Indications point to a seemingly healthy condition as regards the planting of shrubbery plants and flowers. And now," he adds: "Unfortunately have San José Scale. No charge seems to have been made for them. This I am spraying to kill, while I am spraying to prevent fungi."

J. G. Engle, of Lancaster county (Western section), says: "Only a few young apple orchards yielded well. Bartlett and Kieffer pears good. An extraordinarily large crop of peaches, fruit fine, selling at good prices. Among cherries Conestoga, Yellow Spanish, Reichart, E. Richmond and Large Montmorency are the best, and Sharpless, Gandy, Crescent and Greenville are the best strawberries."

Calvin Cooper, also of Lancaster county (Eastern section), writes: "The season as a whole has not been a successful one. First, rot in strawberries; next, drought and rust in raspberries, and later, with exceeding heat and humidity of the atmosphere seemed to parch the foliage of many of our fruit trees, thus bringing fungous attacks on fruit and trees. Among diseases in the apple orchard, the scab played sad havoc on my favorite winter apples. In order to get ahead of this most damaging enemy, I to-day (December 11) heavily sprayed all trees with a strong solution of Bordeaux mixture, thoroughly wetting trees and ground. On a friend's peach trees I noticed the "shot hole borer" had gotten in its work very thoroughly and killed the trees. This is a new insect here."

Daniel D. Herr, of Lancaster county, says: "This was the best year I ever had. Currants brought \$1 per crate, wholesale. Strawberries averaged 7 cents per quart box. Japan plums 7 to 10 cents, while Damsons sold for 3 to 6 cents. Kieffer pears fine. Sold at 10 to 15 cents per half peck, while Bartletts brought only 6 to 8 cents. Asparagus was a big crop and brought good prices."

Casper Hiller, of Lancaster county, says: "Here and there was an orchard of apples that produced good fruit. Was this the result of good care, peculiarity of soil, or location? The questions are worthy of consideration. Low ground, fairly level, clay loams or land so situated that the wash of adjoining fields can run over it are the places for orchards. Pear crop was about equal to the demand. When Bartletts sell as low as 50 cents per bushel, the growing of them is not enticing. Kieffer yielded the most money at \$1 to \$1.50 per bushel. Peaches on young trees fine, old trees overloaded with small fruit, but good. Prices 40 cents to \$1 per bushel. Extra fine \$2.00. Some extra fine Albrights brought \$4 per bushel in our Lancaster market. Cherries better than usual, but as a rule, not a success. Rust, mildew, rot, aphid and curculio, cause the trouble. Early Purple, Conestoga and Great Bigarreau the best. The Eaton grape at its best is the ideal in berry and cluster, but sometimes fails to set full clusters. For several years a new bird pest (Red Eyed Vireo) has injured many grapes. Strawberry crop large, prices ranging from 3 to 10 cents. In some of the new varieties, such as Marshall, Crawford and Wm. Belt, we have beauty, size and quality, but many of these new varieties, in the long run, do not measure up in quantity to Crimson Cone, Buist's Prize and Wilson, that some of us grew 40 years ago. Raspberries, blackberries and gooseberries all did well. Erie blackberry (being hardier) is taking the place of the Lawton. Snyder and Early Harvest are good and productive, pity the latter is so small."

L. Rogers, of McKean county, speaks of the large yield of wild

blackberries and raspberries, which shows that the soil is well adapted for the cultivated varieties.

A. B. Greenlee, of Mercer county, writes of the damaging effect of blight on pear trees; rot in plums, and of the cold weather of the previous winter killing the fruit buds. Grape and small fruit crops were good.

John P. Freed, of Montgomery county, says: "This is a dairy county, and very little attention is given to fruit growing. Peach yellows struck this section, and scarcely a tree escaped."

Wilson M. Gearhart, of Montour county, says: "The berry crop was especially good in this section."

A. S. Shimer, of Northampton county, says: "Peaches and small fruits did well."

Rev. D. E. Schroeder, of Northumberland county, writes: "The season was in general a favorable one, perhaps a little too wet. Peaches in most places were especially fine. Some rot in grapes. Concord and Pocklington did best."

Thomas B. Meehan, of Philadelphia county, reports a fair crop of all fruits, but apples and quinces. The planting of trees, shrubbery, plants and flowers, for ornamental purposes, continues, and in this respect I believe Philadelphia county surpasses any other county in the State.

E. O. Austin, of Potter county, makes especial mention of the small fruit crop. "Strawberries were never better and the few raspberries and blackberries grown, produced very fine fruit. We depend mainly upon wild berries, the crop of which was prodigious. For the first time my pear trees commenced to blight. The season early was very cold and wet, then very dry and cool, and then scorching and a drouth, making an unfavorable season for the growing of vegetables."

E. Pinchot, of Pike county, says: "Yellows damaged trees and peaches. Strawberries and red raspberries good. Of grapes, Concord and Niagara alone were good."

M. B. Eshleman, of Perry county, says: "Peach crop was the largest we ever had. Season was favorable for vegetables."

R. S. Searle, of Susquehanna county, says: "Our people fail to give proper attention to their orchards. Those who put into practice the lessons taught at our institute succeed. Those who failed to put them into practice failed, or in other words. While they slept, insects, blight, etc., etc., destroyed their orchards. Our people are nearly all engaged in the production of milk, and at the prices received are unable to meet current expenses."

O. P. Shaver, of Somerset county, says: "The Champion peach is a very rapid wood producer and a most excellent peach. Muriate of potash and South Carolina rock appeared to cause the disappearance of leaf curl, which prevailed to a considerable extent."

John F. Boyer, of Snyder county, says: "We have an immense scope of ironstone soil very suitable for fruit farms. Many of these hills are already planted to peaches, etc., but mostly by farmers, who becoming crowded with work, neglect their orchards, and then complain that there is no money in the business."

W. H. Stout, of Schuylkill county, writes: "The season opened favorably and early crops of all kinds did well. Latter part of the summer was too dry. Potato bugs were largely destroyed by a small steel-blue beetle, many fields escaping injury thereby. Codling moth and curculio did not damage early fruit on account of wet weather, but late crops suffered as usual where not sprayed."

S. M. Baker, of Tioga county, says: "There was a very light crop of all fruits, except plums and peaches, which were fair. Tent caterpillars were more numerous than ever before."

Dr. George G. Groff, of Union county, says: "Plum rot was bad and destroyed most of the crop. Cherry trees, except Early Richmond, dying from some unknown cause. Probably the soil not adapted. San José Scale holds on and my opinion is not changed as to its pernicious character."

Willis Cowan, of Warren county, reports a big crop of plums, cherries, grapes, raspberries and blackberries.

Theodore Day, of Wayne county, says: "I am grafting new varieties of apples every year, but results come slowly. I have taken over 2,000 borers from 300 apple trees. I have my ideal early sour apple in Trenton Early, 20 oz. best fall, and Newtown Pippin and Winter Vandevere the best winter. Pear blight was never worse. Vegetables, generally a poor crop. Too wet and cold and too many persistent bugs. No progress in the planting of shrubbery, etc., outside of towns."

Pressly Leech, of Washington county, writes: "We had a very cold spell last winter. For about a week it was below zero, which I think damaged our fruit, and dry weather in the fall was hard on vegetables."

A Ruth, of Westmoreland county, reports a dry season and apples selling at 90 cents to \$1 per bushel, though they are poor in quality.

William Mosier, of Wyoming county, says: "Potato growing is our principal industry. The crop was fair and sold at 50 to 60 cents per bushel. One farmers sold 1,400 bushels of apples at 40 cents per bushel, in the orchard. Several car loads were sold at \$1.00 per hundred pounds and shipped to Rochester, New York."

E. H. Cocklin, of York county, says: "The season was dry but generally favorable to growth and maturity of most fruits. Among the Japan plums, Abundance is the best and a money maker. Prince Engelbert the most profitable among European varieties. The Locust Hispa was even worse this season than last, killing many valuable trees."

President S. B. Heiges, of York county, says: "Apples were a good crop, but not keeping as well as last year. Less blight in pear than usual. Immense crop of peaches. Japanese plums doing remarkably well. Grapes unusually fine. Brandywine my best strawberry. Vegetables all fine but potatoes."

L. W. Gwynn, of Greene county, says: "The season being very dry most of the fruit failed to properly mature. Peaches a failure as well as the apple crop. Fair yield of grapes."

George W. Owens, of Huntingdon county, says: "Half a crop of apples, moderate yield of pears. Peaches good yield, good quality. Quince trees vigorous, with fruit medium to extra large. Dry weather injured nearly all small fruits. More than usual interest taken in shrubbery, etc."

Wm. P. Brinton, Corresponding Secretary, of Lancaster county, says: "Pear trees again affected by blight. Not nearly as many peach trees in my section as there were ten to fifteen years ago. Crop was fairly good. Japan plums taking the lead. Small fruit crop was below the average."

In the foregoing report is comprised the leading points in the reports received from the different counties. Many of them will be found of great interest to the Pomologist and Agriculturist. The thanks of your chairman are extended to the members of the General Fruit Committee, and to others whose replies were so promptly forwarded, and the many things of value to the Association, and would respectfully solicit the same courtesies for whomsoever may be your chairman another year.

Death has again invaded the ranks of correspondents and of the General Fruit Committee, the following having died during the year: Henry S. Rupp, of Shiremanstown, as previously having been stated, died on Saturday morning last, January 15th, only a very short time after sending in an excellent report from his district. Henry M. Engle, one of the original founders of the Association, and at the time of his death first vice president, and A. C. Sisson, of Lackawanna county.

WILL FUTURE FRUIT GROWING BE PROFITABLE?

BY E. C. BRINSER, *Middletown, Pa.*

Whether profitable or not, depends on conditions. It might perhaps be answered both in the affirmative and in the negative. I appear before you with this paper upon the subject with less enthusiasm than I should have done a few years prior to this time. Then I figured upon the receipts in cash value upon certain crops, not knowing as well then as now the other side of the issue, i. e., the expense connected therewith.

It is quite easy for any one conversant in mathematics to sit down and farm an acre of strawberries, or any other berry for that matter, upon paper, as well as plant orchards of various fruits, or to plant vineyards of grapes, etc. I repeat, it is quite easy to estimate the number of plants, trees or vines, their probable or actual cost, the cost of planting and caring for them possibly, the enormous crops they shall be capable of producing, and then the very hopeful price we shall receive for all these goods. But, alas! Not always so. I am aware we read and hear of many who grow immense crops of fruit and sell them for great sums of money, but we don't hear much of those poor fellows who no doubt were just as enthusiastic and from certain conditions made a failure. Nor do we hear so much of the great amount of money and labor expended in producing these extraordinary crops, for extraordinary crops are produced under very extraordinary circumstances and conditions.

I admit it is very fascinating to hear of a few apple trees that would yield 44 bushels each and sell at 50 cents per bushel from your wagon, or \$22.00 per tree, and 50 trees to the acre would amount to \$1,100.00. This sounds really wonderful. Or to read of growing 200 to 400 bushels of strawberries an acre, and sell at \$3.00 and upwards per bushel, seems a very profitable investment that we should all be ready to embark in it at once. Or to have a report of 246 bushels of fine peaches on less than 100 five-year old trees, at 75 cents per bushel. (Well-nigh \$400.00 per acre). Now I presume you are ready to exclaim, a bonanza or Klondike indeed. Or to take a report of one of our own members, of 9 tons of grapes on two acres. This great crop at 2 cents per pound amounts to about \$180.00 per acre. Or take one of my own crops, if you please, of 102 bushels of blackberries on seven-

eighths of an acre. These at \$2.00 per bushel, a very reasonable figure, amounts to no less than \$233.00 per acre; a really profitable return.

Of course if I should enumerate the failures that occurred since then, you should be ready to divide by—well I guess we better not divide now. But I will say that I have not had another such a crop in ten years, and sometimes almost entire failures in growing blackberries. These are extreme cases, I admit.

I shall now endeavor to make a few other statements which are more in harmony with the actual condition as we find them by experience and investigation. A large peach grower in a near-by county reported 7,000 bushels, which averaged 70 cents per bushel, when commissions and express charges were paid. You are ready to admit that the receipts were quite handsome. Out of this amount the picking, packing and hauling to the railroad station had to be paid. It cost possibly about \$250.00 or \$300.00 to thin this fruit on the trees, for under no other circumstances could the fruit have been fine enough to command even those prices the past season. Taking into consideration the cost of the trees, the planting and caring for them to bearing age, and the use of the land, it is a question with me whether the profit was such as to warrant great enthusiasm. From what I deemed a reliable source, I learned that in the height of the season, when the greatest bulk of peaches were marketed in the Juniata belt, the price was about 35 cents per crate, delivered to the railroad. If my information is incorrect I shall be glad to be corrected. But if correct then you will surely say with me that the crop was unprofitable.

I wrote to several fruit growers to ascertain more fully, but failed in the attempt. In my own peach crop I was more successful in obtaining fair prices. My crop was not large, owing to the trees being young and many under bearing age. Perhaps about 1,000 baskets all told were nearly all sold from the wagon and out from the orchard, averaging about 60 cents per one-half bushel basket. This fruit was carefully thinned, was fine and perfect, but had to sell in open competition with other peaches of various grades, from prematures to good fruit.

Now I have mentioned but a few of the various kinds of fruit. I might lengthen out my paper by dwelling on other varieties, but would only weary your patience.

Taking everything into careful consideration, the actual cost, the rental of the land, the cost of fertilizer, etc., the great amount of labor, the eternal vigilance required to fight insects and fungous diseases, the loss of trees by premature death, caused by blight and yellows, etc., the low prices of fruit when a good crop, the cost of

transportation, etc., added to the failures which we are sure to have, causes me to be less enthusiastic than in earlier years.

Now gentlemen of this Association, don't understand me to cry down the business. I believe yet if we are at all favorably located we shall derive as much or more profit from future fruit growing as from any other calling pertaining to the tiller of the soil. I am here in the interest of the business, and my paper is prepared with a view to create a discussion on the subject, to bring out your views, which may result in mutual benefit.

THE FUTURE OF PLUM CULTURE.

J. W. KERR, *Denton, Md.*

Like all other futures, we can only "see through a glass darkly." Any attempt at outline or delineation must be diluted more or less with the uncertainty of prophecy. In many things, forecasts on the future, based on events and facts of the past, are conspicuously and surprisingly accurate; but in matters pertaining to any branch of American fruit culture, the past is simply a wasted scroll—intangible beyond even the penetrating irradiation of reasonable prophecy. No cast-iron rules are applicable; no fixed grooves are practical in progressive nineteenth-century horticulture. Coincident and nearly co-equal with the electrical growth and spread of the brotherhood of man, Nature is blending and amalgamating her varied progeny in the vast realms of horticulture.

The older authors in botany endeavored to erect insurmountable barriers between species; but the ever expanding decrees of progress proclaim that "not one stone shall be left upon another" of such arbitrary separations. The intermingling of species radically different from each other, and by a sort of horticultural wedlock, making them of the same bone and flesh, rather pointedly indicates that the trend of plant civilization has some analogy or correspondence with the highest order of Creation. Now with such conditions to confront it is at once quite clear that to conceive or portray, with any considerable accuracy, the future of American plum culture, would be insuperably difficult. To a student of the subject from a practical standpoint, the darkest shadows of doubt would rise high enough to obscure any such conception. To rise above such shadows, imagina-

tion must be inflated with the intoxicating ether of enthusiasm to a degree that makes it a false guide because of its intensity.

The status of the subject to-day makes it preferable to direct a discussion of it in the line of probabilities that may exert greater or less influence and to some extent govern the future culture of this fruit. Twenty years ago the only plums found in our city markets were those of the European or *Domestica* group, grown mostly in New York State then, and the aggregated crops of the country did not exceed half a dozen car loads. This fruit is grown with profit now in nearly every State in the Union; hundreds of car loads are consumed annually by the people. The improvement of our native species, and the introduction of the Japan, have revolutionized to an extent such as accords to every section or locality a fair chance in its culture. The epicurian sentimentalism as to the superior quality of the *Domesticas*, rapidly dwindled into inanity as competition and enterprise enforced improved methods of cultivation and handling of the fruit. The decreasing few who obstinately adhere to the pinching grooves of traditional customs are compelled to face the truth, that an acre of judiciously selected varieties of our native groups yields a revenue in ten years three to five times larger than an acre of the finest *Domesticas*. Net receipts are wonderfully potent and convincing arguments. So extended and far-reaching as to even modify pomological esthetics, as well as reform superannuated notions or connections as to quality.

STILL IN THE ALPHABET OF PLUM CULTURE.

In some respects we are still in the alphabet of American plum culture; this is no less the situation scientifically than practically. Many puzzling problems bearing upon every feature of the business, awaits solution. That stagnation—the inevitable outgrowth of “knowing it all”—is not dangerously imminent. Starting with the stocks upon which the trees are propagated, as it stands at present, there is need of great improvement. In this important relation no progress has been made. The loudly praised Marianna, is, in no practical particular, any better than what I believe to be its legitimate parent—the Old Myrobalan. All our Marianna stocks are propagated from cuttings—a method more or less pernicious, and that robs them noticeably of that persistent vitality that characterizes stocks grown from seed. Where budding is employed as a method of propagating on stocks of the Myrobalan group, numerous instances of uncongeniality between them and many varieties of both native and Japan plums, will be manifest after planting in the orchard. In my own experience, I have had hundreds of trees to live until the additional draft incident to fruiting began; then lacing or binding

at the juncture of bud and stocks, followed by discoloration and dying of the bark at this point soon killed the tops, while the stocks themselves, in most cases threw up sprouts from points below. I am fully persuaded, that for this State, and southward, or in any locality where the peach tree survives the winter, that one year peach seedlings, root grafted, are decidedly preferable to the Marianna, or any other strain of Myrobalan stocks. When root grafted on peach, it is only a question of a few years for such plum trees to supply and support themselves with their own roots—thrown out above the union with the peach root. This method, however, is objectionable to some extent with some of the native groups; notably the Chickasaw and Wildgoose, the roots of which prefer to run near the surface, and are more or less troublesome on account of a tendency to send up suckers or sprouts from the roots.

As the interest in plums presents greater promise of permanency now than ever before, the question of stocks becomes more puzzling. The ideal stock upon which to propagate plums for commercial orchards, must be free from the annoying tendency to send up "suckers" or sprouts from the roots; it must be vigorous and hardy; and quite as important too, it must be of adaptive habit, so that it will conform to and unite firmly with either buds or grafts inserted in it. Stocks grown from seed of the Wayland group of natives, if they do not fully and entirely meet these requirements, approximate them more nearly than any others that I have experimented with. The future of plum growing, demands careful experiment and investigation on this line.

JAPAN PLUMS.

It is difficult to make intelligent conjecture as to the influence and ultimate effect the introduction of the Japan or Tri-flora group will have upon American plum growing. Critically and definitely, we know but little of them yet. The fruit itself, thus far, is plainly acceptable and popular in the markets. If more extended and thorough trials develops no serious ailment or defect peculiar to the group, they will inevitably take high rank in the esteem of commercial plum growers. On the Chesapeake and Delaware peninsula, however, as well as in several other localities, the trees are not succeeding as was hoped for earlier in experiment. After producing one or two crops, they are affected with a disease somewhat similar to the "yellows" of the peach, and a great many have died during the last two years. No discrimination as to the kind of stocks on which the trees are worked is observable; a fact that lends coloring to the theory that they are susceptible to diseases not common to other plum trees. That the group, as a whole, is not constituted or capacitated by nature to withstand or recuperate from great draft upon vitality

incident to heavy crop production, with anything approaching the promptness and power of the native groups, in that respect, is an unquestionable fact, and one strongly supporting the presumption of short life of the trees. Still stronger significance in this relation, attaches to the pre-disposition of the group as an entirety, to early and heavy bearing. Whether or not the average life of the trees be comparatively short, will not materially affect the future interests of plum growing, as the vastly increased competition and energy among propagators, makes frequent and extensive planting far less expensive now than a few years back.

POLLINATION.

The problem of pollination is one than cannot be satisfactorily solved without the precise and penetrating investigations of scientific workers. Practical orchard operations alone fail to reconcile and properly account for the apparent caprices of nature, as exhibited in the flowers or blossoms of different varieties, superficial and important ostensibly, they however constitute the dividing line between sterility and fertility—between fruit and no fruit, profit and loss. The masses of fruit growers are beginning to realize that judicious selection of varieties for profitable orchard culture embraces something more than a keen perception of the particular varieties that bring the most money in the markets. Hence this question of pollination looms up as something new to the rank and file; and as it affects the practical fruit culturist of to-day, in one sense it is new. The records of naturalists of the past, disclose the primary truths and crude principles, without any elaboration or even succinct suggestions of the very important relation it is destined to sustain in connection with practical horticulture or fruit growing. The marvelous expansion of this industry in our country, has created a necessity for concise, accurate and general teaching, or information as pertains, not to botanical species of our wild flowers, but directly to the subject as it relates to the orchard—the varieties it contains; and in this relation, the influence of soil, locality and surroundings, upon the organs and functions thereof, of the blossoms.

THE NATIVE GROUPS AND THEIR VALUE.

Liberal diffusion of such information, not encumbered by technicality, or padded with verbiage, would be especially helpful in promoting a just and proper appreciation of the value of our native groups of plums. The same principles and lines of procedure that have made a success of our apple, peach, pear, grape and berry culture unmistakably admonish us, that these natives possess and control the vital conditions, that will mould the destiny, the commercial

future of our plum growing. The greatest factor in the successful development of the various branches, which collectively constitute the great industry of America fruit culture, can be truthfully described in half a dozen words, viz: Varieties of American origin for America. From the accumulations of years of horticultural neglect, these native groups of plums have sprung into a commercial prominence that has given their improvement such an impetus, as to defy the unwarranted prejudices born of foggyish, and lack of discernment. West of the Ohio river and south of "Mason and Dixon's line" they are pre-eminently the plums for the masses—the people; that class whose avocations create appetite and capacity, and whose preferences incline them to the consumption of the brilliantly colored plums of our native groups: plums that can be grown with certainty and at a cost that places them within the reach of the soiled hands of the laborer, the mechanic, and their families. This means a market—a ready sale for vast quantities; it means business at both ends of the line.

How long will such business remain profitable to the grower? "That's the question." It is safe to predict that if planting continues on the same scale for five years to come, as it has been conducted for the last five years, the large city markets—the centers to which a majority of the growers consign their fruit, will be greatly taxed to handle it. Methods however are changing; much of the fruit will 'ere long be sold to the shipping points; which will be a reform of great significance to the producer. Then there are hundreds of situations, throughout the country where they can be grown for many years to come, at greater profit than most other fruits. Interior towns ranging from 3,000 to 20,000 inhabitants are not supplied with this fruit. Excessive freight charges intervene and enhance the cost beyond the reach of general consumption. Such places present opportunities for profitable culture by persons residing near enough to enable them to sell the fruit from their own wagons directly to the consumers. Even at the low figure of two cents per quart, grown and sold in that manner, the shadow of the dreaded "wolf" would never be likely to fall across the doorstep of the grower. Plum growing, like every other branch of fruit culture—and indeed every occupation and calling of mankind, has a goodly per cent. of followers, who unfortunately mistook their calling.

No reason is obvious why, even with extensive planting of the most popular varieties of the annually bearing native groups, over-production would be more probable with them, than with peaches, pears, berries, etc. The inexorable law of nature decrees that "the fittest shall survive," and results would doubtless be the same in either case. Not many years hence, some owners will be grubbing up Kieffer pears

and Elberta peach orchards for the same reason that an occasional inheritance of great wealth, lands the inheritor in the almshouse.

The future of plum culture, in so far as supply and demand affect it, is equally as safe as that of any other fruit, the culture of which has attained commercial proportions. It is sometimes suggested that the plum, as a fruit, is not adapted to as great a variety of forms, in which to use, in the economy of the household, as are apples, pears, peaches, etc., and for this reason, the possibility of over-production is more certainly assured. In this connection, and as a partial offset to such pessimistic views, I would ask, how many who disguise the taste of the meats they eat at their hotel dinner with the appetizing catsup, have a full conception of how and what the handsomely labeled commercial brand of that commodity is derived from? Not from plums by any means. The person who fears that no use will be found for large supplies of plums, would learn a valuable lesson were he to visit a vegetable packing house when in operation, and note what use is made of the filthy refuse of the tomatoes packed there; and if he is not thoroughly converted that many uses not now in practice are easily possible and practicable for plums and other fruits as well, his faith is too weak to venture far in fruit culture.

As a commercial orchard fruit, the native groups possess decided advantages, in some important particulars, over the Tri-flora or Japan group.

- 1st. They are more reliable as bearers.
- 2nd. The fruit is not so liable to rot.
- 3rd. The trees possess much greater vitality.
- 4th. The injury to the fruit from the curculio is conspicuously less.
- 5th. The trees are of better habit and form for the production of large crops without injury from splitting and breaking of their limbs.
- 6th. The trees are hardier in many respects, more resistant to disease and insect foes.
- 7th. The trees live longer. Twenty successive annual crops have in no perceptible way diminished their power of crop production.
- 8th. While the price obtained does not range quite as high per basket, the net proceeds per acre is greatly in excess.

As previously stated, in many respects, we are still struggling with the alphabet of plum culture; gravitating slowly but certainly toward correct principles and rational methods; this constitutes the best guarantee for the safety and perpetuity of its success.

SOME SUGGESTIONS ON APPLE CULTURE.

BY HENRY C. SNAVELY, *Lebanon, Pa.*

The apple is the most important of the fruits cultivated in this country, from whatever standpoint one views it. It can no longer be regarded as a luxury. Its use has become so universal and varied, and the demand so constant, even increasing year by year, that an over supply, except in years of extraordinary yield, need not be feared. Even then, if the fruit were of high quality, the demand would be fully equal to the supply. No fruit is used so universally and in such varied forms, a matter I need not advert to in detail for the varied uses suggest themselves to you.

As an article of commerce, the apple is growing in importance. Take the total export for crop of 1896 and we find it to run into millions of barrels—2,122,400 barrels. The yield of apples was then a large one, and close to the Atlantic seaports, the expenses thereto were relatively small. Relative cheapness stimulated this foreign demand. The year 1897 showed a light crop of fruit in this section, and much of it of inferior quality, yet prices ranged relatively high. In the face of a short crop and high prices up to December 18, 1897, we exported almost 600,000 barrels. This fruit is selling at good prices at the auction sales in different European cities, and it is of more than passing interest to note the prices realized for the different varieties.

Here is a list of prices realized for a lot of 2,000 barrels, sold at auction on December 7, 1897: York Imperial, \$4.00 to \$4.50; Baldwin, \$3.50; Newton Pippins, \$3.37½; Ben Davis, \$4.37½; Winesap, \$3.85, and Jenitons, \$3.00. These prices may be a pointer to the prospective grower of apples, at least for foreign consumption.

For a number of years I have advocated greater attention to this special branch of horticulture, and in all these years have seen no reason to change my opinion, but rather the conviction has grown stronger with me as the years go by, that with a fuller knowledge of the requirements of this fruit, Pennsylvania could add largely to its wealth by cultivating it more extensively. That apple culture can be made as profitable in a series of years as any of the ordinary farm crops will not be questioned by those who have given attention to the subject. That in many sections of the State, it could be made much more profitable is equally clear. I am not sure that this

Society has done its full duty in the past, though I am sure it has done more to develop the fruit interests in general and apple culture in particular, than all other agencies combined. And to you belong the thanks of the entire community, for you have for many years prosecuted the work without the aid of State or nation. Your work was unselfish. You did a vast good and paid your own bills. There was no paymaster behind you to urge you forward in the good work. Will the people—will the State ever appreciate you and the work you have done? Let us hope.

It is believed that relatively, Pennsylvania has as large an area adapted to the cultivation of the apple as any State; while geographically it is close to the main seaports and to millions of population in the eastern cities. With these advantages—soil and markets in our favor, it behooves us to take advantage of the situation. The field is largely ours if we but improve the opportunity.

SOIL.

So much has been said as to the soil adapted for the apple, as well as the preparation of it for the young trees, that this phase of the subject may be passed over with just a few words.

A water-logged soil or one underlaid with a stiff sub-soil, impervious to water should be avoided. The roots of the apple trees will be unable to develop and perform their functions in such soil. On the other hand, a thin soil underlaid with slate will not grow a good tree, or develop good fruit.

A naturally good soil, well prepared, both as to tillage and plant food, will grow thrifty trees and in due time with proper care of them, produce good fruit. Much has been said as to the slope of the ground, and in some sections one slope may be preferable to another, but on the whole, it seems but little importance is to be attached to the slope of the ground. That drainage—cold air drainage—is a matter of more concern would seem reasonable. Cold air like water seeks the lower levels, and it would be well to avoid land otherwise desirable, where cold air settles from areas more or less extensive.

VARIETIES.

The commercial orchardist will confine himself to as few varieties as possible, making sure that they are the very best for his locality.

As a rule, unless one is near to a large city, the earlier varieties should be planted in a limited way. The fruit is perishable, and if the market is overstocked, a loss is the result. With late or winter varieties this is different, for they can be put on the market for almost half the year.

In planting, select thrifty young trees and buy from a reliable nurseryman. The holes should be made large and the best earth filled close about the roots. Cultivation should be the watchword

from the start. Hoed crops may be grown in the orchard for some years, but grains and grasses should be avoided. To supply ammonia in the cheapest form, either the red or crimson clover should be sown every two or three years. Aside of its manurial value, the long penetrating roots of the clovers open the subsoil and make of it a kind of a reservoir to hold moisture for times of need. Besides the clover furnishes humus, something essential in successful orchard work. A deep porous soil, aside of fertility is essential.

Shall we use stable manure or not There are those who advocate its use in orcharding, but to my mind better results can be obtained by the use of potash and phosphoric acid in other forms. It is believed that the kind of food largely determined the quality of the fruit. So by the judicious use of animal bone, or dissolved rock, and potash in some form, with frequent seeding of the clovers to supply the ammonia as well as humus, the perfect orchard soil can be obtained.

There are many advocates of low headed trees. The only advantage that suggests itself is the ease of gathering the fruit. While very high trees should be avoided by heading back as necessity requires, the middle road should be adopted. The fruit on the lower branches of very low headed trees is generally inferior in size, color and flavor, all of which is due to the exclusion of the sunlight. As the aim of the grower is first-class fruit, the tree should be so trained and pruned that all portions are open to the sun. If the head of a tree is too dense, best results are not possible, both by exclusion of light and the tendency to overbear, nor can the best work be done with the sprayer.

CULTIVATION OF BEARING ORCHARDS.

On the subject of cultivation of bearing orchards, there is a diversity of opinion. Judicious cultivation is regarded as desirable and advantageous; in fact, if dependence is to be placed on the legumes to supply one of the elements of fertility, it is a necessity. The plow is not surpassed for effective work, but for orchard work, as a rule, it is too destructive of the roots, which should not be disturbed or broken. On soils clear of stone and other obstructions, the improved spading harrow is to be preferred.

SPRAYING.

It is too late to question the need of combatting insect foes and fungous diseases by spraying. Profitable apple culture without spraying is out of the question. Spraying pumps and the various mixtures are adjuncts to successful orcharding. Passing over the various applications required, reference may be made to a few matters contrary to general belief and practice.

Prof. Slingerland asserts that the codling moth deposits its egg

on any portion of the fruit, and only after it is hatched does the young worm make for the calyx. The general belief is that the moth lays its eggs only in the calyx after the petals have fallen. It may also be observed, that in a week or ten days after the dropping of the petals, the sepals forming the corolla fold up and make it impossible to get any insecticide within the calyx. This being so, it teaches the importance of prompt work with the Paris green solution as soon as the petals have fallen, to be repeated several times as conditions may demand.

Too little importance is attached to the injury inflicted on fruit bearing trees. The insect, because a visible thing of life and motion, is too often supposed to be the greatest foe of the fruit farmer, while on closer inspection more loss results from the various fungous diseases. More vigorous warfare should be directed to the eradication of fungi, for these troubles are the cause of more inferior fruit and fruit failures than the insect depredations. The foliage of the tree must be preserved, for any injury from whatever cause to the leaves of trees, impairs the functions of these organs, and without perfect foliage holding on to the tree to the end of the season, perfect fruit can not be expected. Perfectly healthy foilage this year is a condition precedent to perfect fruit next year. Without the one the other is impossible.

Appropos of spraying, in the January number of the Farm Journal, Dr. Jabez Miller, of Fitchburg, Mass., addresses a communication to Mr. Atkinson, taking the ground that three ounces of sulphate of copper to fifty gallons of water is equally as effective for combatting fungi as the Bordeaux mixture. It is to be hoped that this matter will elicit some discussion at this meeting, for how to keep the foliage in health to the best advantage is a most important question.

Thus, in a general way, the essentials to successful and profitable orchard culture are first, the right kind of soil; second, careful selection of varieties; third, applications of the right kind of plant food; fourth, careful cultivation; fifth, proper training of the trees; sixth, guarding against insect foes and fungous diseases.

EXPERIENCE WITH SOME OF THE NEWER CARNATIONS AND ROSES.

BY W. P. BRINTON, JR., *Christiana, Pa.*

The list of newer carnations has grown to such proportions in the last few years that it is impossible to give an account of all. What we need is fewer new varieties put upon the market until their degree of perfection is raised much above where it now is. I do not mean to advocate a discontinuance of hybridizing, as this can be developed into one of the most interesting branches of our work, and it has been through the careful and systematic selection of parentage that the present standard of this flower has been attained. Indiscriminate use of the camels hair brush could not have accomplished our present results.

I have been growing seedlings more or less for the last eight years, and I must admit that I am a poor propagator, as I do not see how a large stock of good, vigorous plants, such as will produce thousands of strong cuttings, can be grown in three or four years from a beginning of one plant, unless the plants each season be literally hacked to pieces, which means a sacrifice of vitality.

A complete system should be adopted by which each new variety seeking honors could have a more thorough and extended trial, and there should not be placed before the growers some promising seedling that has been coddled up for three or four seasons, and then hastened into the market for fear of another applicant catching the buyers fancy first. Let me cite as an example, a variety of sterling worth. By that I mean a variety that has given satisfaction to the greatest number of growers, and one that at the same time is satisfactory to the consumers, if I may use the term. The carnation in question is Wm. Scott. This sort was introduced not as the prize of a set sent out by Dorner & Son, but as one of some merit, and worthy of a trial. Md. Albertini, which also came with the set alluded to, was supposed to be the prize. You all know the relative positions of the two kinds. Now I do not know where I could go to get 100 blooms of Md. Albertini to-day, and I do not know where I could go that I would not find the Scott. Stuart and Western King, which completed this set, have shared the same fate as Md. Albertini.

While the buying public much appreciates novelties, be it in flowers or other commodities, it also appreciates a good thing. A

short time ago I happened to be in one of the wholesale cut flower houses of Philadelphia, and while there, perhaps a half a dozen retailers came in. Not one of them went out without some Scott carnations. Not because there was nothing else in stock, nor because this variety was the cheapest, as there were numerous other pink sorts to be had at the same price, but they wanted them because they looked the best, and gave the greatest satisfaction to their customers.

The man that will produce a red Wm. Scott will be a benefactor to the flower growing and flower buying people. Triumph, is a valued addition to the list of pink flowering varieties, that promises exceedingly well. A large flower with good stem, and pleasing color, a little darker than Scott. While at their original homes, Victor and Della Fox, two promising varieties from Philadelphia, do exceptionally well, they do not seem to be creating special interest generally.

There are numerous new varieties of all colors knocking for admittance to the chosen circle, but experience with them is limited to the introducers as yet, and until another year, the growers as a body will be obliged to speculate largely as to their relative worth.

In white varieties, numerous new ones have endeavored to replace Lizzie McGowan, but as yet, I think I am safe in saying, this variety still contributes by far the most blossoms to the market of the middle States. Of the newer ones, Flora Hill surpasses all others that I have seen, in quality. Much has been said of it and more can be justly said. Storm King is also a beautiful flower, with long stems and open habit. Nivera seems to give satisfaction with New Englanders, but in this section it is obliged to stand back as did Mrs. Fisher, for indoor culture. Harrison's White, from what I can learn from other sources, is not what its parent Wm. Scott has proved to be; it lacks blooming qualities.

In scarlets, we are decidedly behind, from some growers point of view, as we still cling to Portia, which is now nearly of age, a record she can well be proud of. We, like many others, had a seedling of our own that promised to surpass this old variety, but it would not stand the test of time. I have not tried either Morella or Jubilee. The latter has a reputation for being a good subject for rust, an enemy I do not care to cultivate further acquaintance with. Good varieties of this color we are especially deficient in, unless this years introductions fill the vacancy. Here is a good field for the hybridizer to work in, as there is always a shortage of this color about the holiday season. Mr. Hancock's Fire Fly surely merits a trial. Rust proof, free as Scott, etc., so he says.

It was only a very few years back that Yellow Carnations, or those with yellow the predominating color, were much in the minority, but now this class is pretty well filled. Where Buttercup is well done, it

scarce need look to its laurels, but with us it has not been a continued success. Eldorado, is too rusty, though a very fine flower when well grown. Kitty Clover, sent out at the same time, never breaks its calyx, but owing to its pistils being so well developed, it is very apt to become fertilized and goes to sleep too soon. I like Gold Finch. It is not a large flower, but a very full one, on a stiff stem, plant vigorous and well suited for side tables.

Mayor Pingree, is an exceptional flower, and deserves what has been said of it. With us it is not as free as desired, but we hope further experience may help its blooming qualities.

The list of fancy carnations is keeping pace with the fixed colors. Each year has been adding its full quota. Helen Keller, has proved to be the best of this class with us, though we were never enabled to get the prices for this flower that some of our brother growers reported when it was still a novelty. The flower of Lilly Dean is good, but the stem is a little weak; perhaps a heavier soil might overcome this drawback. Maud Dean, a companion to the former, is not what we expected of it after hearing its praises sung so freely last year. With us its color is variable, but shows a tendency to rust, and is a poor grower. I do not think it is here to stay long.

In summing up our experience with some of the newer carnations as they appeared, I am led to think it is not always best to place too much confidence in the largest advertisement, nor to rely wholly upon the reports from the city retail florists in selecting new varieties for trial. While it is very interesting to have each season a goodly number of the novelties to watch and develop, and you may firmly believe that at last you have a money maker, but it does not always prove so profitable, and the price of carnation flowers will not warrant the expense necessary to procure a full list every year, from which one and sometimes none, become valuable additions to the commercial cut flower grower. (My remarks do not apply to the rooted cutting man, as he reaps his harvest and is booming something else before the rest of us are fully acquainted with the newcomers.)

Since they are now springing up from Massachusetts to California, it is impracticable to see them at their homes, and those of us who are not specialists—and we are in the vast majority—cannot find it profitable to make the effort to see many before we buy. So we must use our best judgment in selecting those that promise vigorous growth and freedom of bloom, as these are two points of first importance.

I have endeavored to treat this portion of my subject wholly from the cut flower growers' standpoint, and since the topic assigned to me also includes roses, I shall give my observations of those that have come under my immediate attention only. In the cut flower

list there seem to be absolutely no dangerous rivalry to take the place of Bride, Bridesmaid, Perle, Meteor and Am. Beauty in respective colors. Mrs. Pierpont Morgan, Belle Siebrect, and a few others have been endeavoring to win favor in the eyes of the public, but each year we hear less of them. The new hybrid tea, Pres. Carnot, however, merits a more substantial stand, as it is a very pleasing addition to this class of roses. Its color might be described as the daybreak rose. Its foliage too, adds much to its beauty, being large and heavy, and very dark green.

In the general list for out-door planting, Mosella or Yellow Sonpert is a little jewel; flower of better form than Clothilds Sonpert, and just about as abundant a bloomer, though not truly a yellow rose, as its name would indicate, the center being light yellow shading to white on the edge. Pink Sonpert, is also a valuable acquisition to our list of free blooming roses, deep pink in color, and always in bloom. Often a dozen blossoms on a very small plant. Since the advent of this trio, the Polyanthas out quite a figure in the plant sales of to-day.

Striped Lafrance, is too indistinct to be of much value, and with our culture hardly merits its name. Crimson Rambler, is now too well known to need any words from me. Yellow Rambler, I have not seen in bloom, but its habit of growth is good, though not so vigorous as the one preceding. No doubt this rose will soon be as popular as its Crimson relative. I do not see why the much talked of Empress of China was ever sent out, when our list of climbing roses is already so replete with beautiful varieties, it is so near single and of a very much washed out pink color when open. Its redeeming features are, however, growing and blooming qualities, as it out-classes anything I have seen in these respects. Perhaps after we become better acquainted I shall value it more.

Margaret Dickson, is the only one of the new hybrid perpetuals with which I have had experience. While it did not bloom last season, the plants being small, it made such strong canes that I feel sure it will be a No. 1 white rose of this type.

My knowledge of some of you is, that you share with me the feeling that we are not in the business of growing our various crops for glory alone, bread and butter being our chief object, and as much more as we can get.

In conclusion, let us encourage the production of new varieties, and when we have achieved some success, let us not be too hasty in recommending anything but that which has proved of exceptional value. As there is a general tendency to overdo these new things in many lines beside these which I have mentioned, to the detriment of all concerned.

A WASTE OF MONEY.

BY W. H. STOUT, *Pine Grove, Pa.*

For more than twenty years, I have carefully treasured and read the transactions of the Pennsylvania Fruit Growers Association, without the personal acquaintance of any of the members, and from the proceedings have obtained much useful as well as profitable information, which would have been even more advantageous if it had been available before it had become a year or more old. In this age of progress the useful lessons taught at these meetings should go out fresh as ripe peaches. In the case of new fruits that are valuable, and new insect enemies that are dangerous, the people of this Commonwealth are entitled to get the information quickly.

In selecting a topic for an essay on this occasion, I was puzzled to find a subject that might not be one selected by some of the veteran horticulturists present, who will no doubt dwell upon correct methods in the treatment of orchards, therefore give you a few observations under the title of "A Waste of Money."

Since we may learn as much or more from our own errors and the mistakes of others, as from the successes we hear and read about, sometimes magnified unintentionally a trifle or more by interested writers, I refer to some observations, which were lessons in wrong practice that are to be avoided by those aspiring to success in fruit growing.

For many years I observed with each recurring spring and fall, in various localities at railroad stations, boxes and packages of trees, distributed through those indefatigable tree agents and nurserymen, so that by this time enough stock has been distributed in this State which if properly planted and cared for would supply the markets with all the fruits consumed by the people of Pennsylvania.

Undoubtedly, all the trees purchased were planted, so that it is a question what becomes of them. Admitting that many trees die from natural and unavoidable causes, such as storms and blights, yet the losses from these sources are comparatively trifling, taken as an average.

There are many thousands of trees planted yearly that never produce any fruit whatever, and many more, if they survive the treatment to which they are subjected, have a precarious existence and

the fruit borne is of such a character that it is not fit for use, and if apples, will not make decent cider.

Some persons appear to act under the belief that fruit trees will grow and thrive anywhere, and in selecting sites for trees the very poorest are taken under the mistaken notion that the best land cannot be spared for this purpose, reserving for less remunerative crops the best location, with the usual result of failure and a loss of the trees, and the labor bestowed upon them.

I could point out a place where a hundred apple trees, costing each twenty cents, were planted on a barren hillside, where briars would scarcely grow, and in their shallow dry bed after ten years standing, some dead, from direct starvation, others killed by borers, and all moss covered, scraggy, unthrifty; making no new growth, and never producing any fruit worth gathering.

Another instance is where thrifty well cared for trees are planted so close that since they attained an age and size suitable for bearing, the limbs interlock and shade the whole orchard, that the fruit does not attain its natural color or flavor.

In two locations I noticed apple trees planted in marshes, where the water stands on the surface at times, and never sinks more than a foot from the surface, and after ten and fifteen years standing the trees are the size of a well cared for tree about three years planted.

The fruit from these trees or any in similar situations does not interfere in market by reducing prices.

An old farmer, the owner of at least six farms, selected a steep, north-west slope for a peach orchard, planting the trees about ten feet apart (to save land no doubt), which produced one scant crop of fruit, then gave up the struggle for existence, and out of several hundred trees, all died, save one, as a reminder of a folly committed by an old farmer when old farmers should know better.

These may be extreme cases, but no doubt they fit duplicates in other sections, indicating on the whole a great waste of money and effort.

There are many instances where more favorable selections are made for an orchard, faring but little better than in the cases cited, because they belong to the farm and rotation is the order, so we find them in grass, corn, oats, wheat and grass again, with boys plowing with a strong team, heavy plow, iron traces, tearing up the roots, breaking off the bark, throwing the ground away from one side of the trees and against the other side, and even dragging young trees down, if not with the plow, then surely with the harrow to follow.

If one rotation of this order does not finish up the trees the second will, and if they should survive, the trees show their abuse in dead limbs, decaying trunk, and in appearance more representing a well-worn inverted splint broom than one of the best gifts of God to man.

Then there is another enemy to tree culture, that is the tree butcher. You see him in the winter or early spring with an axe, hacking away, bruising the limbs, making ragged cuts, chopping off limbs and cutting every bit of growth away until the bare limbs with a bit of tuft on the end, stretching their naked arms heavenward, as if appealing in that direction for help.

Notwithstanding the Pennsylvania State Horticultural Association has unselfishly for almost two score years tried to teach correct methods, and no doubt accomplished much good, their work has not been appreciated as deserved, and while many of its teachings have reached anxious readers after being a year or more delayed, many copies have found lodgment in the garrets and outbuildings of those who are supposed to distribute them among their constituents, if they did not find their way to the junk shop in bulk. So there is no doubt that a great amount of money is wasted in purchasing trees, in planting, neglecting and abusing them.

On the whole, no doubt, the farmers of Pennsylvania have wasted more money on trees than the Legislative investigating committee did last winter, and not one has been rewarded with a foreign mission so far as known. Not having even a good apple or a can of peaches, excepting such as are obtained from members of the Pennsylvania Fruit Growers Association.

There are a few cardinal principles to be remembered in fruit growing. In planting trees, never let the roots get dry; do not plant in very dry soil; firm the ground thoroughly about the roots in planting. The plant food in the soil must be abundant to produce new growth and mature a crop. Thirteen per cent. potash, 10 per cent. phosphoric acid, 2 per cent. nitrogen are good proportions for exhausted or poor soils.

Thin fruit so that each specimen has ample space to grow freely and obtain nourishment. Spray often with Bordeaux mixture and Paris green. Plant mostly good keeping late apples.

CHESTNUT CULTURE.

BY FRANK M. BARTRAM, *London Grove, Pa.*

The prominence given to chestnut culture in horticultural society programmes and in agricultural papers, is evidence that men are investigating this promising phase of agriculture. We know that the

tree thrives and bears here, and we also know that the present demand not only absorbs all the home product offered, but in addition, over 10,000 packages of chestnuts come to the port of New York alone every year. With the two main factors of production and demand satisfactorily established, there would seem to be nothing but the details and methods of the industry to be determined. And with production a reality, suitable acreage available, markets within easy reach, and demand constant and active, we have no right to complain nor echo that doleful cry "farmin' don't pay," without giving chestnuts a chance.

Chestnuts are used now mainly for deserts, relishes, or sold along the streets as peanuts, in constantly increasing quantities. We find frequent mention of them in cook books now for dressings, and they may also be prepared as a vegetable. Except among some of the Indians, the people of this country have not learned to dry the nuts, grind them into flour and cook as cakes or mush as is so very commonly done in parts of Southern Europe, where chestnut flour is counted among household necessities.

So that it is likely to be a long time before the question of over-production will vex us. If it should be that an unusual quantity should reach a single market at once the nuts are not so perishable but what they may be kept in storage or shipped to some distant and less favored market, with the assurance that they would reach it in good condition. Not so with berries, early vegetables or milk.

And chestnuts have other advantages over these. A heavy rain at picking time may ruin berries, but chestnuts may be gathered just as well to-morrow; a dairy requires skilled attention the year around and on Sundays, and Sunday confinement has driven more than one boy from the farm. An established chestnut orchard should surely yield as many bushels per acre as corn and with little more expense than gathering. Consider the difference in price. The Albion Chestnut Co. sold their Alphas, the earliest variety for \$14.00 per bushel in New York. The price falls as the season advances to \$6 or \$7. Corn must be planted every year, but a chestnut orchard once established will last almost indefinitely.

It has been urged against nut culture that you have to wait so long before returns begin to come in. As Col. Stuart asks "My dear friend, don't you have to wait anyhow?" But in the case of grafted chestnut trees you do not have to wait so long. An old tree grafted over to a choice variety yielded a bushel of nuts the second year, which sold in Philadelphia for \$10. I have frequently seen in the fall, burrs on grafts set the previous spring. Mr. J. H. Hale said that in Georgia nuts thus set, matured superbly. Grafting exerts a remarkable influence in this respect. And all the profitable chestnut orchards will be of grafted trees. Out of thousands of chestnut seedlings

raised and tested by Luther Burbank, only four were deemed worth saving and these must be increased by bud propagation.

The custom of large planters has mostly been to plant seedlings of the American chestnut, or of such varieties as Paragon, Numbo and Ridgeley, and after these trees are fully established, graft to desired varieties. The claims made for this are the trees are of course much cheaper, and the loss of a tree in transplanting or by accident will not be so severely felt. Sometimes a very unfavorable season following the setting out will so impair the vitality of a tree that the top will die back, while a branch will start from near the ground, this in the case of a grafted tree will sometimes occur below the union. For small plantings, to test varieties, and to provide wood for grafting, the purchase of grafted trees will be preferable.

Many dread the imagined loss in transplanting. I lately walked through a six acre orchard planted last winter with American chestnuts, alternating with pears and cherries, and I noticed but three dead chestnut trees out of 300 planted, a loss of one per cent., which was less than with the cherries and pears among them, planted at the same time and by the same men.

As to varieties, Numbo, Paragon, Scott, Hannum and Ridgeley might be mentioned among the numerous good kinds usually classed as European types. They are good, thrifty, rapid growers, bearing early and regularly, good crops of large, handsome nuts, that sell for about six to eight dollars per bushel wholesale. This strain and most of these varieties are well known.

The Japans, last season were fully up to the standard claimed for them. They do not grow so large as Paragon, are more compact—a beautiful lawn tree. They make a perfect union with American stocks, have resisted a blight that in some sections last season did serious damage to the foliage of American and European chestnuts.

They come into profitable bearing early, are regular croppers of large nuts in small burrs, that ripen early, thus securing the highest market price. The quality is not usually as good as other strains when eaten fresh and raw, the skin around the kernel is apt to be bitter, but like the Ben Davis and Kieffer, their size and appearance bring welcome additions to an often depleted purse. For cooking, the Japans are equal to any and with less trouble to peel.

Of the varieties now propagated, every one will want to try Burbanks Early, when it is offered for sale, as such exalted claims have been made for its superior quality.

Alpha and Early Reliance are very early in season, good yielders of good sized nuts. Mr. Killen has an early sort valuable for its good color and flavor. Kerr, is also of good color and the burr has remarkably few and short spines. Parry's Giant and Killen, come a little later, are good growers and yielders, and of the largest size, the

color of Killen is against it, being light. The market at present gives preference to a dark brown chestnut with not too much fuzz, though by many, pubescence is considered a sign of superior flavor.

There are many acres in Pennsylvania where the natural growth of chestnut has been cut for timber (nuts are not the only thing of value about a chestnut tree). Suckers have sprung from the stumps in these clearings, which may in some cases have been grafted to improved varieties of chestnut. The established root system will cause the grafts to make a vigorous growth and soon bear good crops. It must not be expected that in all cases as good returns can be secured from this practice as where chestnut trees are set out in orchard form and given orchard culture. It is unreasonable to look for as much profit from neglect as from care. But I am persuaded that this sucker grafting will prove a useful suggestion to many.

The late Mr. H. M. Engle did considerable work of this kind amid discouraging surroundings, and our esteemed Rural New Yorker has now addressed itself to condemn the whole practice from this one instance; mainly on account of the chestnut weevil, and the difficulty in the Engle case of keeping down underbrush. I understand that Mr. Engle's grove is upon a very steep and rocky hillside.

The Engle grove as all such stump grafted groves must be, are on the site of where chestnuts have furnished breeding grounds for the weevil for generations, and they will not display natural proclivities if they move off at the mere asking. Natural trees in surrounding forests will keep up the supply of these depredators indefinitely, and groves in such vicinity will be ever endangered. In this respect, the chestnut culturist is no exception to farmers in other lines, for he is at the disadvantage of uncontrollable surroundings of neighbors.

Prompt gathering as yet seems the most promising method of combatting the weevil, and this must be unremittant. Mr. Moon says when he first began this course, nearly all his nuts were unsalable, but by persistent effort he has attained gratifying results.

Grubs are the natural food of hogs, and one of my neighbors is very enthusiastic over the manner in which his hogs are exterminating the chestnut weevil. While weevils are bad, the nuts as soon as gathered should be dipped in hot water, subjected to dry heat, or treated with bisulphide of carbon, and then hurried off to market; for prices are rapidly falling, and if a grub should be incased in a chestnut, don't let him have time to get out this side of New York sidewalks.

One need not lament that he cannot derive any benefit from the improvement made in the varieties of chestnuts because he has no large block of ground to devote to the purpose. Chestnut trees make fine specimens for lawn, roadside or pasture, and every farm has room for at least one tree of a kind that will be not only an ornament, but whose product will give enjoyment and profit.

PAPERS READ AT THE ANNUAL MEETING OF
THE STATE HORTICULTURAL ASSOCIATION
OF PENNSYLVANIA, HELD AT HARRISBURG,
PA., JANUARY 18 AND 19, 1899.

REPORT OF GENERAL FRUIT COMMITTEE.

BY HENRY C. SNAVELY, *Chairman.*

Since our meeting a year ago in the city of Lancaster, our brother P. C. Hiller, then full of hope and life, has passed away. His removal from the scene of activity and usefulness is cause for regrets from all whose privilege it was to know him.

Your President requested me to assume the duties assigned to him. I accepted with reluctance, feeling that I could not fill the place as acceptably as those who held it before.

The blanks for fruit crop reports were sent out about the 10th of December, and reports were received from all but a few counties, enabling me to compile a report covering all sections of the State. Respecting the results of the year 1898, as gleaned from sub-reports, I report as follows:

APPLES.

With few exceptions, the yield of apples was light, of poor quality and not keeping well. Fifty-three correspondents report "next to a total failure," "very poor," "very short." Seventeen correspondents report "an average crop," a "fair yield." There were apples in some of the counties of the northern tier, but the most favored counties were in the mountain districts. Somerset and Cambria in the western section, and Monroe and Carbon in the eastern.

The cause assigned for the failure of the crop is a cold, wet spring, during the time of blossoming, preventing pollination. Some correspondents report a full setting of fruit, but was lost later in the season by dropping. This may be due to imperfect fertilization. The drouth and heat caused much of the fruit to ripen prematurely, entailing a still further loss. With the excessive rains during and after blooming, it appears that spraying both for insect depredations

and fungi proved of little value, and some of the correspondents seem to be almost ready to pronounce spraying a failure.

A number of correspondents speak well of the York Imperial. Noting the vigor of the tree and especially the healthy foliage. Some speak highly of the Sutton Beauty.

The past season was a severe test of the vigor of trees and healthfulness of foliage, and the wide awake apple culturist will do well to plant varieties that hold the leaf to the end of the season. No full crop of perfect fruit can be expected from trees that shed the foliage prematurely when caused by rust or blight.

PEARS.

The pears proved a better crop. Fifty-one correspondents report a good crop, while only seventeen report a poor crop.

Blight still prevails, but not as destructive as in former years.

Due to the shortness of the apple crop, the prevailing prices for pears was remunerative.

Bartlett, Seckle, Lawrence and Kieffer are mostly mentioned as profitable varieties.

The Kieffer suffers less from abuse than formerly, and some who sneered at it now have a kind word and a smile for it.

PEACHES.

The majority of the correspondents report a poor and short crop. Yet about thirty report a half crop or a good crop. The wet weather causing rot proved disastrous to the earlier varieties, but the later varieties ripened perfectly, and brought high prices.

It appears that young, vigorous trees produced the best results.

Yellows prevailed to an unusual extent.

The small crop is largely attributed to the low temperature in April when the buds had swollen ready to bloom.

The Elberta and Fox Seedling, among the newer varieties, are worthy of a place in every orchard.

In the Juniata district, the Smock and Wonderful are accounted the most profitable varieties.

PLUMS.

The plum crop was largely a failure. About twenty correspondents report a medium to good crop. The Japanese varieties are gaining favor in some sections of the State. As usual the crop was subject to the attacks of the curculio, and black knot was more destructive than usual.

My own experience is that the Prune Engelbert, is practically exempt from black knot. Standing in an orchard surrounded by

varieties that were destroyed by the knot, the Engelbert has not shown any sign of the disease.

Mr. Wm. Loesch, of Erie, says the "German prunes in this section do not need any spraying or lime, and bear every year more or less."

"Miss Rose McGanchey, just east of the city on the lake shore, at a summer resort, where hundreds of people visited and saw it, had five-eighths of an acre and sold 425 bushels at \$2.25 per bushel f. o. b., here in Erie, from one hundred trees ten years old, \$1,530." Many trees are planted, but Mr. Loesch says "they are all imported trees, home trees are not much account, as they have plum roots."

QUINCES.

The quince is seemingly not grown to any large extent, but quite a number of correspondents report good crops of fine fruit. The quince worm, the curculio and rot are the main drawbacks to the cultivation of this fruit. The trees are about as much subject to blight as the pear. Champion and Orange are the leading varieties.

CHERRIES.

Favorable reports were received from more than half the counties in the State. The success or failure is not confined to any section, but like other crops succeeded in spots.

Of the sour varieties, the Early Richmond and the Montmorency are mentioned as among the best.

Of the sweet varieties, Gov. Wood, Black Tartarian, Yellow Spanish and Napoleon are most frequently mentioned.

In some portions of the State heavy rains set in when the crop was about ready to pick, which caused rot and a total loss.

This delicate fruit appears to be one of the most difficult to grow to perfection.

GRAPES.

In the eastern part of the State the crop was light and of poor quality, while the western part of the State reports, as a rule, a good yield of good quality. Failures are reported in the latter section, so also a few report the crop a success in the former section.

Concord and Worden are most frequently mentioned as favorites.

Some correspondents report that none were perfect except where sprayed.

The canning or bottling of grape juice is becoming quite popular, and in some sections a great deal of fruit is used for this purpose. One can have the grape in liquid form the year round. The juice is unfermented and considered very wholesome.

SMALL FRUITS.

Strawberries were a fine crop over the larger portions of the State, the south central portion being the exception. The failure in this section is attributable to cold and wet weather during blooming, and excessively warm during ripening. Prices ruled low.

The raspberry and blackberry yields were good, except in sections where the drouth prevailed.

The currant and gooseberry do not seem to receive much attention.

Mention is made of some of the newer varieties as being very promising.

We note Glen Mary, Bismarck, Brandywine and Clyde. The last is reported to be of poor quality. The Miller raspberry is not spoken of with much favor. Loudon is commended.

Kansas cap is doing well where tried.

The Early Harvest and Erie blackberries are favorably mentioned.

VEGETABLES.

Somewhat more than half the reports indicate favorable conditions for vegetables. Generally the western and northern portions of the State proved most favorable while the eastern and southern portions suffered from drought. The spells of high temperature no doubt were as damaging as the absence of moisture.

Progressive agriculture and horticulture will have to give more attention to the conserving of soil moisture. He who learns how to hold soil moisture is not so much dependent on frequent rains.

As to spraying, one correspondent says that farmers believe they derive most benefit from air slaked lime on vegetables.

The cabbage worm appears to have been very destructive, and had all seasons for its own, and stubbornly resisted all the means and measures brought forth for its subjugation. The potato bug is a fixture. It comes as regularly as the seasons, but the wise man "who knows what to do next, will mix its ration with Paris green and the beetle will be at rest.

SHRUBBERY—PLANTS AND FLOWERS.

From only a few counties comes the report, no progress, no advance. No homes anywhere should excel the farmers' homes with the adornments of nature. A farm home where trees, shrubs and flowers are planted and cared for is a place where one can look for contentment, for happiness and refinement. It is a place where the boys and the girls are prone to stay, or if duty calls them away, it has its home ties and attractions.

The adornment of rural homes with an abundance of fruit is a prime factor to a happy home life; it is an evidence of generous,

broad-minded and public-spirited citizenship; it is the mainspring of true patriotism.

Happiness and human welfare are not always gauged by dollars and cents.

The taste for brighter surroundings is growing and it could be hastened if more attention was paid to it on the school ground and by nature study in the schools.

SPRAYING FOR FUNGI AND INSECTS.

While spraying is practiced in most of the counties of the State, it has by no means become general. Wherever spraying is done, it is attended with success. Owing to the frequent rains in the spring of 1898, this work was in many instances neglected, and where the sprayer was not used, the usual results followed. There is still a prejudice against the use of poison, and while there may be room for doubt, on fruits like raspberries or the peach, it can be safely applied to smooth skinned fruits.

With insects and fungi on the increase, it is idle to hope for crops of perfect fruit, unless they are vigorously combatted.

A vigorous warfare against insects and fungous diseases is the price of sound, healthy fruit.

FERTILIZING AND CULTIVATING.

It is not enough that insects and fungi are contended against. A sickly and starving tree is a ready prey to all the ills that attack vegetation. Well fed, well cared for trees will resist the ravages of fungi better than such as struggle for existence.

At the bottom of successful fruit growing, lies judicious feeding and cultivation, and to a lack of these many of the failures are to be attributed.

The farmer's orchard is very often the most neglected spot on the farm. It may be used as a pasture lot for horses and cows, with a stiff sod and no fertility applies. Because there is a heavy sod it may be broken up for a crop of potatoes or corn, still further robbing the struggling trees. It goes to grass again without much or any fertilizer, and the owner wonders why he can not grow fine fruit.

It is about as rational to expect fat hogs without feeding, as to expect crops of fruit without feeding.

GENERAL OBSERVATIONS.

J. V. Garrettson, of Adams county, says that in his opinion the drought in midsummer checked the growth of the apple. Later the fruit developed but did not mature, which accounts for its poor keeping qualities.

C. L. Longsdorf, also of Adams county, reports the pear tree psylla becoming a dangerous pest in his county. He also reports the San José Scale as being in his county. Spraying has been practiced for some years with excellent results.

W. Fulmer, of Allegheny county, reports the best peach crop for many years. Quinces generally do well. Not over one per cent. of the fruit growers spray.

J. Donaldson, of Armstrong county, says while the apple trees bloomed abundantly, the crop was very unsatisfactory. The small fruit dropped and what was left proved imperfect.

H. L. McKibbin, of Beaver county, reports a full crop of peaches. Many places the trees broke down. Berries grew to perfection. Home adornment on the increase. Shrubbery and flowers cultivated at nearly every home. Spraying is neglected, though its success is no secret.

Oliver D. Shock, of Berks county, reports all fruit yields in his county as below average, or poor, except the grape.

Howard G. McGowan, also of Berks county, says that the planting of the peach is on the increase in his portion of the county. Not very many apples are planted, but quite a great many pears, and Kieffer seems to be the leading variety.

Frederick Jaekel, of Blair county, reports that all varieties of plums do well in his county, of protected from the curculio. Apples, poor in yield and quality. Pears, a fine crop. Spraying practiced to a limited extent.

R. M. Wells, of Bradford county, reports the grape and strawberry crops as fine and good. Favorable season for vegetables. Steady advance in the cultivation of strawberries, plants and flowers. Spraying not practiced to any extent.

William H. Moore, of Bucks county, reports a failure of about all the fruit, except the cherry, but can not explain cause.

H. W. Comfort, also of Bucks county, reports poor crops, except cherries and small fruits. Little attention paid to spraying.

M. L. Makin, of Cambria county, reports a fair crop of apples on high land. Pears very good. Grapes good crop, finds nothing to take the place of Concord as a money maker.

J. V. Mancher, also of Cambria county, says apples, pears, quinces, cherries, grapes and small fruits were good. As a whole the season was favorable. Spraying is practiced quite extensively with gratifying results. Potato growers speak highly of the liberal use of lime in spraying, some claiming an increase of 25 per cent. to 30 per cent. in the yield.

F. G. Judd, of Cameron county, says large crops of good apples, keeping well. Favorable season for vegetables.

E. Bauer, of Carbon county, says apples a good crop and keep well. No peaches. Small fruits very good.

Prof. Geo. C. Butz, of State College, Centre county, reports apples and pears light yield, peaches moderate, plums plentiful, strawberries imperfect, due to wet and cold. Excellent season for vegetables except celery, which blighted badly. Spraying is gaining slowly.

Jos. W. Thomas, of Chester county, says no apples, pears a good crop, peaches good for an off year. Reports much progress in home adornment. Not much spraying.

J. Hibberd Bartram, also of Chester county, reports apples almost a total failure, quality very poor, knotty and rough, although trees were well sprayed. Fair yield of pears, particularly Kieffer, Seckel and Lawrence. Spraying not practiced as a rule among farmers. Mr. Bartram says he is not as favorably impressed with the effectiveness in the preservation as after the first years.

Samuel Hall, of Clearfield county, reports a large crop of cherries; do well in his locality. Apples light crop. No spraying.

E. M. Tewksbury, of Columbia county, report apples poor yield. Pears fair. All succeed fairly well, except to old Pa. Blue. Small fruits cultivation as well as home adornments are on the increase. Spraying attended with fair success. Mr. Tewksbury says that after years of observation and careful attention he has come to the conclusion that nearly or quite all the ills that affect trees, shrubs and plants, are the result of insects.

James Turner, of Crawford county, says that if one follows the small fruit business exclusively it pays well, and none better than the strawberry. Blackberries come next for profit, and only the Ancient Briton. He puts the Bubach, Brandywine and Michell's Early at the head of the list for profit. He regards the matted row system the safest and best. By close attention to the business, Mr. Turner believes the growing of berries to pay as well now as ever before. All fruits yielded well except the apple.

Jno. F. Rupp, of Cumberland county, reports fruits and vegetables a failure, with the exception of berries and quinces.

Gabriel Hiester, of Dauphin county, says York Imperial was the only variety of apple that produced a full crop, all others either a

failure or very defective. Pears good yield, very good quality. On closely pruned vines, a good crop of grapes. Sweet cherries good yield, sour cherries light.

E. C. Brinser, also of Dauphin county, says he had good crops of peaches in some orchards, none in others. Seventy-five per cent. of the early and medium varieties rotted. Late done well. Fox Seedling up head. Grapes and strawberries poor crops. Apples a poor yield. Mr. Brinser takes a gloomy view of the fruit situation. He says he has lost 75 per cent of ambition and about 30 per cent. of faith in fruit growing.

Joseph H. Paschall, of Delaware county, says some of the early varieties of apples did fairly well, but very few winter apples. Pears a full crop and fine. Berries and quinces fine crops.

William Loesch, of Erie county, reports fine crops of German Prune plums and pears. Grapes extra fine. He reports some spraying, but not much benefit, most of the farmers prefer air slaked lime and think it the better.

C. A. Randall, of Forest county, reports good crops of grapes and small fruits. Season favorable for vegetables. Much benefit derived from spraying.

E. B. Engler, of Franklin county, says apples were almost an entire failure. Pears a moderate crop. Kieffer growing in favor on account of its bearing habits. Peaches a fair crop in favored localities. Japan plums promise well. Grapes light, strawberries plenty. Good results from spraying.

C. W. Good, also of Franklin county, says there is a wide difference of opinion as to the benefit derived from spraying. Mr. Good says that with all the insinuations that in the past we were disposed to aim at the Kieffer pear, it was about the only fruit we had to eat for quite awhile, and we could eat it if we were not hungry and dry. We were almost induced to wish that all our fruit trees were Kieffer pear trees.

Clem Chestnut, of Fulton county, says what kinds of fruits grown in his county were mainly fair crops.

L. W. Gwynne, of Greene county, reports crops fairly good, except apple, which was almost an entire failure. Results from spraying good.

Geo. W. Owens, of Huntingdon county, says apples and pears a small yield, peach and quinces fair crop, the latter very defective. Grapes a failure. Small fruits, fair crop. Says there would be less inferior fruit if spraying was practiced more.

J. E. Jamison, of Juniata county, says pears a fair crop and late peaches fine. He rates grapes in the following order: Concord, Worden, Niagara, Clinton.

Jas. T. Smith, also of Juniata county, reports peaches one-fourth

crop, and quality very good. Apples and small fruits poor crops. The Elberta peach grows in favor, and the Abundance plum seems to be a favorite.

H. W. Northrup, of Lackawanna county, reports apples very short crop. Pears, plums and small fruits good crops. Spraying is done among many of our farmers and with satisfactory results. Progress in home adornment.

N. P. Brinton, of Lancaster county, reports the Japan plums as doing the best. Berries a good crop; apples a failure. Has not been able to see the great benefits of spraying.

Calvin Cooper also of Lancaster county, says the season of 1898, has been the most disastrous and discouraging of my recollection. Excesses of heat and consequently great drought, then unusual rainfall, and oppressive humidity, and the consequent conditions that promote fungous growths, seemed to cripple and destroy the fruit growers prospects. He is fearful that leaf blight on orchard trees will affect next years crop.

Daniel D. Herr, also of Lancaster county, says pears were a splendid crop of most all varieties, and especially the Kieffer, which he places at the head of the list. Prices good. Apple crop a failure. Reports a good deal of spraying, and is no longer an experiment. Japan plums are still pushing to the front. The Elberta and Champion peaches have come to stay.

W. B. F. Johnson, of Lehigh county, reports apples and pears about 50 per cent. of a crop, peaches 20 per cent., plums 10 per cent. Small fruits a light crop.

P. Sutton, of Luzerne county, says Glen Mary does very well, large to very large. Hall's Favorite done fairly well. Bismarck does well. Clyde bears a heavy crop, quality poor. Loudon I think will take the place of Cuthbert. Reports crops poor except grapes, small fruits and vegetables.

Peter Reeder, of Lycoming county, reports nearly all fruit crops very light or a failure. The inferior quality of fruit is noticeable where spraying is neglected.

A. B. Greenlee, of Mercer county, reports the Spy, Baldwin, Hubbardston and Swarr as the leading varieties of apples. He claims the second brood of codling moths damaged the fruit more than the first. Has a new variety of peach called the Mercer, resembling the Crosby, and comes true from the seed.

Henry Ort, of Mifflin county, says he has the Paragon chestnut grafted on the common chestnut, and it is doing well. He wishes to know when to spray for the chestnut worm. Wants to know why the bark leaves his apple trees.

R. F. Schwarz, of Monroe county, reports apples a yield of 75 per cent. No peaches to speak of. Pears fair. No grapes. Spraying

practiced to some extent, and where done certainly shows good results.

Jno. P. Freed, of Montgomery county, says apples a total failure, pears one-half crop. Japan plums succeed best. Berries of all kinds a failure. Great benefits have resulted from spraying.

J. K. Murray, of Montour county, says the past season has been so wet a part of the time and so hot and dry afterwards that all kinds of fruit suffered badly. The codling moth is bad in this county.

A. S. Shimer, of Northampton county, has pear trees dying from unknown causes. Says Abundance is his best plum. Grimes' Golden, York Imperial, Krauser, Spy and Smith's Cider, leading apples.

B. B. McClure, also of Northampton county, reports the outcome unsatisfactory, except small fruits, which were plentiful and good. Increased interest shown in shrubbery, plants and flowers. Spraying not extensively practiced, but everywhere commended where tried.

Wm. L. Nesbit, of Northumberland county, says he has tried and rejected many new sorts of strawberries. Sharpless is better than any for his section. Best crop of quinces for years. Attributes failure of most fruit crops to unfavorable weather in spring and early summer.

M. B. Eshelman, of Perry county, reports apple crop next to nothing. Peaches on high ground only.

Thomas B. Meehan, of Philadelphia, reports most of the crops as poor, the pear being exception. Japanese plums succeed. Ornamental gardening on the increase in the suburbs.

E. O. Austin, of Potter county, reports fine apples in some localities. Large yield of pears. Grapes a fine crop. He says this county has excellent soil and climate for apples—the best in Pennsylvania, I think. The general lands are high, with the valleys of the Allegheny, Susquehanna and Genessee, with their numerous branches ramifying in all directions, so that some parts may be favored when others are suffering by climatic exposures.

W. H. Stout, of Schuylkill county, reports pears an exceptional crop, while apples were a light one. Peaches in the main, a failure. But his trees were just the right age and condition, and produced a large crop. Grapes fine crop; berries a short crop. Vegetables poor, except on highly fertilized land. Spraying practiced to a limited extent, but its benefits can not be doubted.

Jno. F. Boyer, of Snyder county, says the spring was too wet for fruit to properly fertilize, and the fruit that took pollen dropped very largely in June.

O. P. Shaver, of Somerset county, says the season was favorable for all kinds of fruit. The unfavorable part being the neglect of the orchard by so many farmers.

R. S. Searle, of Susquehanna county, says fruit trees have been badly neglected, and as a result, the tent caterpillar has done a great deal of damage. Fruit, with the exception of the apple, and those not grown here, has been very good.

S. M. Baker, of Tioga county, says many people are prejudiced against the use of sprays containing poison. Apples a medium crop; pears very poor. No plums. Small fruits are planted more largely.

J. A. Gundy, of Union county, reports many peach trees dying of yellows. Quinces a fine crop, but no market for them. Spraying not done as much as a few years ago.

J. J. Will, of Venango county, reports plums doing well where cared for. Grapes a good crop, Concord mainly. All small fruits did well. weather favorable for vegetables. But little spraying, but beneficial.

W. Corvan, of Monroe county, reports a fair crop of nearly all kinds of fruit, and a favorable season for vegetables.

Pressly Leech, of Washington county, reports a crop of very fine peaches. With the exception of apples, all crops were bountiful.

Theodore Day, of Wayne county, reports from light to half crops of fruit. Finds spraying necessary to secure good crops of fruit.

W. R. Bernhart, of Westmoreland county, says apples almost a total failure; peaches right good crop; berry crop good. Not much spraying done.

A. Ruth, also of Westmoreland county, says we think it was the cold rains in the spring that destroyed the pollen. Blight is bad on our pear trees, except the Kieffer and Early Catherine.

Wm. J. Avery, of Wyoming county, reports an average crop of apples. Plums good. Picked about 40,000 baskets of strawberries. Has a seedling of great merit, 15 to 20 berries making a quart. Season favorable for vegetables. Spraying practiced with good results.

Col. Jas. A. Stahl, of York county, says apples very poor yield and quality. Pears, peaches, plums, quinces and grapes fairly good yields. As usual Concord grape all right; Niagara fair. Cumberland is the strawberry for his section. Season unfavorable for vegetables. Home adornment on the increase. Very little spraying and that of no account. He says while our old "Uncle Sam" was busy licking the Spaniards, the insects would light right down on us, and played the devil with our hopes and prospects of a great crop of all sorts of fruits and vegetables.

E. H. Conklin, also of York county, reports apples and peaches almost an entire failure. Pears and quinces a full yield. Miller red raspberry worthless, Loudon fine. Unfavorable season for vegetables. Very little spraying on account of the wet weather.

J. A. Herr, of Clinton county, reports a good yield of apples in favored localities, but crop was generally injured by a late frost. Pears fair. Peaches almost a total failure. Quinces good. Plums and cherries a failure. Season favorable for vegetables. Spraying not generally practiced.

HORTICULTURE RETROSPECTIVE—TEN YEARS.

BY E. C. BRINSER, *Middletown, Pa.*

It is about twelve years ago when horticulture was at a low ebb in the lower end of Dauphin, when it was hardly possible to even get a drink of cider; when the luscious peach was thought next to impossible to grow in any quantity; when people were obliged to go to a neighboring county for this much sought for fruit, and when the delicate strawberry graced very few farmer's tables. A few of our small farmers, however, had ventured in a small way to engage in the enterprise a few years earlier but were obliged to dispose of their products in the town, for the country people could not afford to use the luxury, except perhaps a few boxes for jellies or preserves. Their culinary tastes and ideas had first to be educated along this line. This, however, is vastly changed.

The American people are very enterprising, and those of lower Dauphin are no exception. So when people became convinced that these small farmers would convey as many dollars worth of fruit with one horse as a farmer could with four, they changed their minds somewhat, and here and there you would see some one who would enter the new enterprise.

It was about this time when our more enterprising neighbors in Mifflin, Juniata and Franklin counties were having a bonanza in shipping their peaches all over the country, and York and Adams county people became so famous for growing berries. It was about this time when a few of us conceived the idea of trying our hand. In those days we knew nothing of the enemies we had to encounter, except, perhaps, the peach borer and peach yellows. We knew nothing of such a thing as spraying fruit trees—had no necessity of knowing. We looked through a glass darkly, though seemingly quite clear. We saw away off in the distant, piles of those jingling dollars of which our worthy ex-president made mention a year ago. It was just about this time when a friend informed me of the Pennsylvania Horticul-

tural Society and invited me to join. We then knew nothing of such a venerable body. (And now, Mr. President, will you allow me to express my appreciation of this body at this juncture.) I have been an attendant of almost every meeting, and gained much valuable information, though perhaps having added nothing to your body in knowledge or power.

I might thus go on and elaborate upon what others have been doing in this time, but I prefer to dwell more particularly upon a few of my own adventures in this line. To be prepared to meet any emergency, I must supply myself with the necessary outfit. I must read books, periodicals, etc., treating upon the subject. I read plenty of catalogues that were very elaborate in every particular, showing cuts and portraits of immense size, exquisite sweetness, fascinating colors, and of such wonderful prolific powers, that one propagator says the man who don't grow 400 bushels of strawberries to the acre aint in it. Well, I wasn't in it. But I proved to the people of lower Dauphin that at least as fine fruit could be grown by proper culture there as in other districts.

Time moved on however. Other conditions must be met. New varieties of fruit came to the front. Berries became larger, of better quality and more prolific. Of course I must have the best, so I made the venture. With the exception of a very few berries and peaches, and perhaps a few grapes, little progress has been made in fruit in the last decade, so far as our efforts are concerned. I should have mentioned the plum, however. There is an improvement there, and promising good results, I believe. Some specialists in plum culture, I understand, are having good results.

While all this was taking place, horticulture was on the increase. As the products of the farm decreased in value, farmers began the culture of berries, until at this time every town and hamlet is supplied with plenty, and at a price so that people in the most humble circumstances can enjoy the luxury, though even it may not be very remunerative to the grower. Along with the advance in horticulture came the necessity of vigilant warfare against the attack of both insects and fungous growths, of various kinds. Only the most vigilant, persevering and energetic can succeed in producing the finest specimens. Along with all the rest, we must supply the wants of fruits, in the nature of fertilizer, etc. Much has been said, much written, and a great deal has been done, not only for fruit, but other crops as well, until of recent date when the authorities from a very able Experiment Station came to the front with the practical assertion of growing fine successive crops of potatoes on the same land, and the last crop the largest, without the aid of any chemical fertilizer, proving seemingly that enough lies dormant in the earth, only

proper tillage being necessary. Now can't some one come to the aid of the horticulturist with the same practical proof.

Now, gentlemen, I shall dwell upon one more matter practiced, and I am done. That is the practice of furnishing trees and plants otherwise from what was ordered. To elucidate, I can do no better than relate to you just what actually transpired in my own case. To guard against any imposition as I thought then, I steered quite clear of the unreliable tree agent. (Allow me right here to put in a good word for this class of men. Although there are no doubt many who are dishonest. They are by no means to blame for all the dissatisfaction arising from out of their sales).

In planting my first peach orchard, I purchased my trees from a party who positively asserted that the trees were true to name. Of course the trees were all labeled just as I had ordered them, but when bearing time came you should have seen the result. Worthless varieties were palmed off on me. Possibly 30 per cent. of the orchard never proved of any value. The orchard was only a small one, but I sold about \$700 worth of peaches out of it, and if the worthless trees had been what I ordered I could have had several hundred dollars more out of it. Later, I planted larger orchards, and to guard against any more frauds, I visited what I thought a very reliable nursery. I was well received. Everything looked all right, and I placed my order for 1,000 trees. This transaction proved worse than the first. About one-half of the trees were varieties of no good to me. For Old Mixon I had Alexander, for Salway I had a small, sour, red peach, for Smöck I had a puny, white peach of no value, etc. About this time I sent to a neighboring State and ordered twenty Abundance plum trees. Though six years old these trees never had a plum yet. Do you imagine I judge them to be Abundance. My plantings were still increased and I bought more trees, but luckily not from the same parties. Then I bought from another nurseyman an equal number of Old Mixon, Stump, Mt. Rose and Late Crawford peach. Last summer they had their first fruit, and to my surprise one-fourth of them are again of one of those worthless varieties. There are other cases I might cite of minor importance, but presume the above may suffice.

Now don't understand me to say there are no reliable men in the business. I purchased trees from men who furnished me what I ordered, for whom I have all due respect.

These transactions caused me a great deal of chagrin and grief, aside from the actual loss I suffered, which I am sure amounts to hundreds of dollars, and I assure you at times I felt very much like persecuting, if not prosecuting.

Perhaps there are some of our honorable lawmakers present to

whom I might appeal to frame and pass such legislation as will make such transactions a crime and punishable by law.

There can be no earthly excuse for any one engaged in the business to commit such reckless deeds. I call it fraud and imposition. When I would write to the offending parties, they were in nearly every case short and had to buy stock from other parties, who they thought were all right. Thus making somebody else the scapegoat. Well, I presume I may as well let up on this, as words at my command are inadequate to do full justice. I however appeal to the fraternity if not for your sakes, then do for poor humanity's sake, furnish just such stock as is wanted. If you don't have what is wanted be frank enough to say so, and allow your would-be purchaser to buy where he can get it. Now you see I have not been personal, nor have even insinuated, but have related to you facts, such as I trust I shall never have cause to reiterate.

THE PEACH AS A PROFITABLE CROP.

BY J. F. BOYER, *Mt. Pleasant Mills, Pa.*

I have been requested by our worthy Secretary to prepare a paper on peach culture, or the peach as a profitable crop. While I feel my inability to do justice to this very important subject, nevertheless I feel it my duty to respond.

First, I will endeavor to give you an idea where I am located. I am situated fifteen miles west of Sunbury and six miles south of Middleburg. North of us is the Shade Mountain, with an altitude of between five and six hundred feet, next to this mountain is a ridge about three hundred feet high, with only a narrow valley lying between it.

On this ridge we find the most favorable locations for peach orchards. The soil here is known as ironstone, or ironstone gravel.

There are, however, many elements that enter into the requirements of peach culture or its success besides the favorable locations and soil. But the time here allotted will not permit going largely into detail. We wish first to notice the four prominent elements, namely the moisture, the soil, the climate and the man.

The production of the peach can be obtained in the sands of Florida and in the icy clime of the far north. Yet, we would not expect the best results in such extremes.

The climate should be free from all dangerous frosts, but it is not. We get very nervous on cool nights late in spring, when the temperature is likely to fall below the freezing point.

The only and safest way to grow peaches is to locate our orchards on hills where there is more of an equal temperature.

The man is the most important element, he can cause failure where the most favorable conditions surround him. The man himself should have an iron constitution, he must use his brains, he must know chemistry in order to know what element of plant food is removed from the soil. Otherwise the soil may become exhausted and cause failure under most favorable conditions. He must have confidence in the business, and must be able to bear reverses.

The most important question before us to-day is how best and most economically to assist nature in the work and reap greatest rewards.

Chemists tell us that a well matured peach contains about ninety per cent. water, therefore it is essential to have an ever abundant supply of water where the fibres can reach it. We must, however, bear in mind that the peach tree will not bear stagnant water; this is very injurious. Evidently irrigation would bring the desired results. But what is the use talking about irrigation in a section of country where the streams are down in the valleys and the orchards located on the hills, especially if we think about the twenty-seven thousand gallons, the amount necessary to apply one inch of water to a single acre of ground, and in a dry season three such applications a week would be none too much.

I have between seventeen and eighteen thousand peach trees in cultivation, with a ground space of about eighty-eight acres. Were I to apply one inch of water to each acre devoted to peach trees it would require two million three hundred and seventy-six thousand gallons of water for each application. This would be an impossibility for me to do. Could I apply a mulch with straw or litter I might possibly hold the required amount of moisture, but this is another impossibility, and consequently I have been driven to what is known as horse leg irrigation.

The pumps are made by almost all implement manufacturers, are cheap and durable, and seem to do the work very satisfactorily. Any small boy knows that a sponge will absorb more moisture or water than cast iron, therefore, I prepare the soil to act as a sponge and give it a chance to absorb all the water it possibly can.

After every shower, just as soon as the ground gets in proper condition, the cultivators are started and the soil loosened. This will serve as a mulch, also hold the moisture that would otherwise be lost by capillary action. This cultivation will at the same time prepare

the surface soil again to act as a sponge whenever the next shower comes. With the peach, about nine parts of water to one of solids is needed, and it is about time we fruit growers begin to hustle for the water, for I believe nature will come near doing the rest. Of course, peach trees, as well as other plants, rest upon two ever important bases. First, the soil; second, the root system. They are about equally divided in importance, and should either fail in any one point of requirement the tree would suffer accordingly. Different soils and root systems require different treatment, according to structural conditions, as well as in the manner of assimilating nutriment, besides, requiring those nutriment in different proportions, thus showing the importance of knowing something about the foundation of all plant life.

One of the fundamental laws of education is, that we learn by experience. Theories are all right, but practice is better. During my term of fourteen years in the fruit business, I observed three different classes of peach growers.

The first class are those who are determined in their efforts. They are wide awake, because they know it is not the business that makes that man, but that it is the man that makes the business. The second class are those who save at the spigot and lose at the bung. They set out their orchards and cultivate very little and only visit their orchards about the time they expect to find ripe fruit on the trees. They are good salesmen enough to sell anything from a red beet up to a straw stack. They will by hard work manage to hammer enough money out of the business to pay the cost of production.

Then comes the third class. The only way I can see for those to make any money in the peach business is to present the nursery man with the money and positively refuse to take the trees. They would thus save the time and labor in preparing the soil and planting the trees, and not loose the use of the ground. I believe in growing first class peaches, and in having everything clean from the orchard to the curbstone. If I want to do business, I must attend to my business. I will follow peach culture as long as I can keep the soil in a condition to sponge water.

It may not, however, be expected that fruit will again bring the high price any more then wheat, corn, iron, etc. Nothing brings the high price it once did. But what we want is that our peach crop will sell for enough money to allow us a fair profit. Of course, competition may be sharp, as it is in all other classes of business, in the country.

There is every reason to believe that the country has entered upon an era of prosperity, and I believe those who think fruits will not sell like they have sold in the past will prove to make a mistake. I shall

not tie up to the wharf yet. But expect to keep my sails set, so when the fair winds begin to blow, I will not miss the run. There is no danger of fruit eating going out of fashion any more than bread eating will. The immediate future is brighter than the past, therefore let us move forward to the season of eighteen hundred and ninety-nine with confidence.

QUINCE CULTURE.

BY W. B. K. JOHNSON, *Allentown, Pa.*

The quince is indigenous to Germany and Southern Europe. It first attracted notice in the city of Cydon, in Crete, or Candia, whence its botanical name, *Cydonia*. It was more highly esteemed by the Greeks and Romans for preserving, than by us; the possible reason may have been, at that time fruit culture was in its extreme primitive state, and as no other fruit at that time possessed the preserving qualities as the quince did, naturally it was their favorite, and even to this day the quince ranks not among the least. Pliny, speaking of the pear: "All pears whatsoever are but heavy meat, unless well boiled, or baked," and as all our apples originally came from wild crab apples, they, the Greeks and Romans could not have had very choice varieties.

All fruits, from their original wild condition, have undergone remarkable changes, climatic conditions having no less effect in the change brought about. In quince culture there does not seem to have been such radical changes as in other varieties of fruit, as it still adheres to many of its original tendencies. I remember well, and in some localities the idea still prevails, that a quince tree must be planted on the banks of a running brook or springlet, as no other place was considered a proper place for a quince tree. These facts were well established, and in a large measure true, for in such locations the finest fruits were grown, and then the idea prevailed that the quince trees needed a wet soil to thrive. The idea only prevailed for a short time, when they found a low wet soil not adapted to quince culture. To-day, quinces are grown on the hillsides and mountain tops, in fact anywhere, where there is a deep rich sandy loam, retaining moisture through the dry hot summer season. In

such a soil a quince, with proper care and attention, thrives and is a remunerative fruit. In a light sandy soil the trees come to bearing earlier, than in a rich clay loam, but are not so long lived, neither is the fruit so large and firm.

A quince tree is largely a surface feeder. Its fine fibrous roots strike out for the wants of the tree, while others are striking deeper for more moisture, as the foliage of the quince is so constructed that a greater evaporation takes place than on either the peach, apple or pear, it necessarily must drink more, consequently must be able to have a soil where more moisture is stored. In very dry weather the quince orchard should not only be cultivated, to keep weeds down, but also to break the capillary attraction of the evaporation, to condense it right where the surface roots need it most. A quince tree will not thrive in sod, neither will it do well in a hard clay soil; to succeed, the ground should be thoroughly worked, but not so deep that the roots are injured. From my experience I have come to this conclusion, that the quince tree is more susceptible to kindly and careful treatment than any other fruit, likewise, it shows neglect as quickly as the well cared for tree shows its vigor. I have seen in my orchard trees making four and over four feet in one years growth, and the fruit in harmony with its growth, while almost within a stones throw my neighbor's trees made barely one foot new growth. His trees had to do the best they could, hence the fruit was small, irregular, wormy, and more or less blighted, while mine was large, clean and free from worms and no blight. I can see no reason why his fruit should not have been equally as good as mine, had it received the same treatment, for the soil is the same.

The question may be asked, "Does it pay to grow quinces for the market?" If you have a market where you can handle your own fruit, and then give it the attention it should receive, grading your fruit properly, so you bring the best quality on your market, you can command your prices, and such quince culture does pay.

Last season I saw quinces offered at forty, fifty and sixty cents a bushel, and were dear at that, while I sold mine at eighty cents to one dollar a half a bushel basket, for my better grades. I will take as a basis, Messrs. Maxwell's orchard, one of the largest in New York State. They planted about thirty acres, and about three hundred trees to the acre. At ten years they averaged from one to one and a half bushels to the tree, or from three hundred to four hundred bushels per acre, received from two to three dollars per pony barrel, or, from three to five hundred dollars per acre; this was before any spraying was done. Since that they are doing better, the orchard being older and carries more fruit.

I will now draw attention to the treatment of the tree. Soil

should have plenty of humus to be in a friable condition, and for retaining moisture, and then use from two to three hundred pounds per acre each of muriate of potash and South Carolina rock of phosphoric acid, spread this broadcast and harrow it in. When the trees are making a poor growth and the leaves turn yellow, it either lacks nitrogen or moisture. On of the very best locations for an orchard is where you can irrigate it, when necessary. The pruning knife should be used, all superfluous twigs should be cut out, and the new growth headed back. When the fruit sets, every tree should be examined and all imperfect fruit taken out, and if the tree hangs too full, remove enough so that the tree may perfect its fruit, as it is not quantity you want as much as quality, for the latter swells your bank account, while the former impoverishes it.

As to varieties, there are so few to select from. In my little orchard, now about six hundred trees, and when completed about nine hundred trees, I have sixty Orange, about twenty-five Champion, about twenty-five Reas, and the balance Johnson. Had I to start another orchard I would set all Johnson. The Orange and Reas are more subject to blight than the Champion. Champion is a good quince, when a late quince is desired; the Reas is a shy bearer and troublesome, while the Orange does fairly well, the flesh being a little coarse. The Johnson is, however, the best grower, the fruit mild in flavor and evenly grained to the core, but is a little apt to overbear. A jar is placed before this meeting, where the Johnson quince can be sampled to satisfy yourselves as to quality. The Meechs Prolific has always been too unevenly and coarse grained towards the centre. The Cornell University speaks of two new quinces in Bulletin No. 80. The Johnson is named first and the Borgeat second; both are well spoken of.

I will now say a word about insects and fungi; and first, I will mention spraying. No quince grower can dispense with this machine.

Mr. H. Bowen, a New York State quince grower, after having given his trees a careful spraying, sent one pony barrel to Albany and received \$6.00 for less than 200 quinces; unsprayed fruit brought from two to three dollars a barrel. The fruit on the sprayed trees were nearly twice larger than on the unsprayed trees, and he discovered that it had not injured the fruit and kept on. The sprayed trees held their leaves, while on the unsprayed trees one-half of the leaves dropped. This has also been my experience.

There seems to be nothing better than the Bordeaux mixture for all purposes of blight or fungi. Leaf blight is readily held at bay by energetic spraying with Bordeaux. Leaf blight is more troublesome where orchards are in sod, but cultivated orchards are not immune from this same disease. For black spot, spraying is done

about the same as for leaf blight. I read of a case where the fruit was as large as the end of a thumb and an inch long before the first application was made, and after it had dried, the trees looked blue. Two weeks later another spraying was made; at this time the first application seemed to have not improved the condition, and as the fruit was much browned by the operation, it was not carried farther. About the middle of September this orchard was again examined, and the treatment was found to have brought the most remarkable results, the fruit on the sprayed rows were nearly twice the size of the unsprayed rows. Rust is to some extent, or we might say limited extent, always present in old orchards, it is a cedar fungus. Where there are not cedar trees in the section, orchards are very little troubled, but when it is to be found, and the wind carries the spores, alighting on the quince, and when it first attracts attention it is beyond control. Such fruit should be cut out and burned, to destroy the germ. It is said that the spores of the quince rust is incapable of reproducing spores. History tells us that it was proved that cedars may affect the quinces, or other amenable plants at a distance of eight miles. My advice is, not to set a quince orchard near a cedar grove, as it attacks quinces, hawthornes and apples, and other plants upon which the rust stage appears. Bordeaux mixture is the best preventative known.

Pear or fire blight, is without doubt the most serious disease the grower has to contend with. It is the same disease, so destructive to pear orchards, that in certain years attacks various sorts of apples, particularly the crabs. This disease is easily known from all other diseases, as it kills the entire twig and leaves turn brown as far as the twig is dead; if these dead twigs are left on the tree it will pass downward until the whole limb, or tree, is dead. The only remedy for dead twigs is to cut them out and burn them. Spraying does not seem to check the fire blight, as sprayed trees as well as unsprayed trees, seemed to be attacked. In my quince orchard I had a few; I cut them out as fast as I saw the first signs of attack. On some trees there may have been altogether six or eight such twigs, while others were free, while those not sprayed, and not cut out, the trees looked brown with dead leaves.

Insects.—There are three insects which are troublesome to quince growers; the borer, codling moth and the quince curculio. The borer is so well known that very little need to be said. Examine your trees in May, again in September or October, dig them out with a three-eighth half-round chisel, cover over the wound with grafting wax and the work is done. I never pass through my orchards but I keep an eye on the trees, where I might find them, and I am happy to say that not half a dozen borers were found during last season. The

codling moth is the same as found on the apples and pears, and requires the same treatment. Paris green or London purple catches them at their first breakfast. The quince curculio is closely allied to the plum or peach curculio, and when once established, it is not an easy matter to get rid of it, for where Paris green has been tried it has been found unsuccessful. The Maxwell's are troubled badly with this insect, and they report very little success in spraying. The most successful plan for catching them in the sheet plan, and jarring the trees in the morning; on the same principle as the plum curculio is caught. Some let their hogs range the orchard, every now and then, sow oats or some other grain, so that the hogs will root. In this manner those hibernating in the soil are either killed or disturbed sufficiently that they die. The fungus which is cracking the quince is the same as the spotting of the fruit, and is easily prevented by spraying.

In conclusion, I will say that a quince orchard should receive clean culture. No good results can be expected, if they are kept in sod. In planting a quince orchard, the best results may be expected when planted about fourteen feet apart. The quince crop is a reliable one, hardly ever caught by late frosts. Bees should be near all orchards to assist fertilizing the bloom. Trees should be at least three years old, when set from the bud, and fruit may be expected on trees three years planted, but seldom come in full bearing before they are about ten years old. Careful handling, careful grading pays as well in quince culture as in any other fruit. A shiftless, careless man should never undertake fruit growing, as he will make no better success than in his other line of business; fruit culture needs constant vigilance. Where the ground is wet, it should be well drained before the orchard is set.

ON THE PRINCIPLES OF IMPROVEMENT IN FRUIT AND FLOWERS.

THOMAS MEEHAN, *Germantown, Pa.*

The experienced observer must have noticed that for all the continued introduction of new fruits, vegetables and flowers, there has been very little of permanent progress. The new introductions from

year to year certainly seem better than those of comparatively recent years, but if we look back a much longer period for comparison, the advance can scarcely be observed.

We find in apples, pears and the principal orchard fruits varieties of the long, long ago, just as large, as high in flavor, as productive, and in every way as valuable as those we have to-day; and even in our times we find attempts to displace old favorites for younger ones a comparative failure. Among our pears the Bartlett still holds its great popularity, though as the William Bonchretien of the old world it has had a career of many generations. Indeed all our most popular pears have a record that might be called ancient. In apples the older sorts still hold their own, and when we get to favorable growing regions, we find varieties that have had a long run in the old world still contesting the palm with the children of the new. Most of the more popular apples in Canadian orchards are of the long tried varieties of the old world.

It is the same of vegetables as of fruits. No one can point to a single modern variety that is in any material respect better than those that were popular a century ago. All that can be said is that in some way not yet well known, varieties do not seem to do as well after a few years, and new ones replace the old ones, not because they improve the race, but rather that the good old standard may be maintained.

Even where we do make a start to improve, it is but a sudden jump and all is over; and even these starts are often made by nature herself, without any help from man. Our wild grape gave us the Isabella, the Powell and Catawba and a few others, and still later the Concord and a few others, all accidental seedlings from no one knows what. It is safe to say that no grape to-day can give us better fruit than these same old grapes when they are healthy and well grown. The phylloxera got at their roots and lessened their vital powers. It is not saying that it was not a necessity to replace them by new healthy kinds, but the new ones are not an improvement on the race. Mr. Rogers, of Salem, raised some admirable kinds by cross-fertilization, but he could not get beyond. Mr. Bull tried over and over to get something better than the Concord, but the Concord stubbornly refused to advance. Attempts have been made to raise improved pears from the Seckel, Bartlett and others, but the progeny never exceeds the parent. One might go on and give numerous illustrations.

There seems to be a law in nature which dictates that thus far shalt thou go, but go no further. Indefinite progress seems impossible. When we think over this quietly, this seems a self-evident fact. We know that many vary in size, but no one will believe he will ever see

a man ten or twelve feet high. We may get a horse to run fast, but will we ever see one run a mile a minute. A rose may produce a flower as big as one's fist, but will it ever give us one as large as a drumhead cabbage? Or will there be grapes with berries as large as hen's eggs? And yet it is in some such a line that improvers have generally traveled. They take that which has already made a great departure from a certain standard and try to push that great departure still farther ahead.

To my mind, improvers should go to the other end. We should take something which has not yet made a great departure from the normal form, and start the improving machinery wholly new. Instead of taking the Catawba, Iona, Delaware or any other famous departure from the wild species to raise seed from with a view to improvement, start with the original wild stock, and select from them till the limit of improvement, as desired, is reached. We may not get anything better on the whole than those we have loved and lost, but we shall have something as good and most likely with some valued character wanting in our older friends. This is especially true of vegetables.

We have among our wild plants innumerable species fit for food. They were used as food by the native Indians. Among the umbelliferous family of plants of which our garden carrot, parsnips, parsley and other vegetables are representatives, there is scarcely an American species but were eaten by the aborigines. With care these could be improved just as well as have been these foreign denizens of our vegetable gardens. They would add immensely to our variety, and to the pleasure of mankind, to say nothing of the rich monetary profits to the painstaking improver.

We have tried to raise better fruits, vegetables and flowers in our gardens by saving seed from them, and with poor returns. We have in this been weighed in the balance and found wanting. No plant can vary beyond a limit nature has set for it. Let us go back to the original element as nature provides for us. Start direct from the beginning, and we shall find far more successful results.

SOME OF OUR MISTAKES.

BY C. W. GOOD, *Waynesboro, Pa.*

As a horticultural product, mistakes are a success. My own mistakes made within my limits are a decided success. Looking over fences and viewing teachings retrospectively, I am convinced that there are other things besides misery that love company.

I know now where and how I made mistakes in the past, but I cannot tell what I may do that may be classed as mistakes in the future. A part of my mistakes are a sufficiency for present exploiting purposes, as a standard. Another may think a "here too," but he need not express it, or adopt my standard, in the line of mistakes, as a rule of action. The man that has never enjoyed a mistake of his own has my profound sympathy. Like catching a cold, or catching the grippe, we and our mistakes come together, without any fast running, or any particular desire to catch on, on our part. Mistakes in planting too much or too little of a kind, or too many or too few of a variety, are very common and frequent. In a money point of view, too many varieties is a too frequent mistake. It should be remembered, however, that it is possible to have some enjoyment in horticulture without money success. It is possible, that some things are not mistakes, that do not result in big money. I made many mistakes on account of a lack of knowledge of the adaptability of my land and location. I still made greater mistakes in teaching to others, as a rule of action, that which was not adapted to their land and locations.

I made mistakes in not listening to and heeding others of experience; and I made mistakes in having entirely too much confidence in the teachings of others.

I made a mistake when I made my first planting of peach trees. I did not plant enough, even with all other mistakes connected with the venture. I feared being called a crank. I planted too many varieties of peaches. The stage was experimental. The venture was successful in point of dollars and cents, but had I confined myself to just one variety, that was old and tried, my profits would have been fully three-fold. My second successful venture in peaches was in my not venturing or risking the tide. My third peach venture is now embryonic. I suspect there will ere long be some more mistakes to record.

I made a mistake when I planted grapes, which was a fair success on the whole in a money point of view. With my facilities and the wholesale prices, my mistakes were not in planting too many varieties, but in planting too many grape vines. The number of varieties, as I view it now, seems to have been the source of enjoyment and profit. I have neglected grapes, but my health permitting, I may take pride in duplicating my experience.

I think I made a mistake in planting quinces, inasmuch as had I planted a variety of apples that I have since discovered to be more adapted to the ground planted to the quinces, than the quinces are; not that the quinces did not give returns, but certainly the apple would have given better returns.

I know I made a big mistake in growing plums; not in number of trees, not in varieties, not in selection of location, but in method of planting trees. The two o'clock sun practically destroyed my plum trees. I have made many mistakes in pruning or trimming trees and vines. I trimmed some too much, others too little. Each vine, tree and shrub now seems to me to possess an individuality, that will admit only a certain amount of shivering, as a fitting process, favoring the tide toward uniformity. He that likes to cut and saw, may secure gratification in the pruning art by planting varieties that need such art practice. He may do good to Gibb's apple tree, but certainly not to a Rambo tree.

I made mistakes in packing fruits for shipment and sale. Everybody, from our street urchin to merchant of Calcutta said "honest packing." Our primitive ideas of the virtue of honesty in packing was, that every vehicle should in contents be the same at bottom as at top, the middle should be the same as the top and bottom, and the sides should likewise be the same as the top, bottom and middle. No bright sides up, down, or sideways, excepting as they fall. The situation drifted me away from business men and business methods. I firmed my teeth. I double-headed and bright-sided, and I was told that that was honest packing. Buyers wanted more fruit. Better satisfaction was the result. I got more money for the same quantity and quality of fruit. That, gentlemen, I learned was progressive honesty.

I would not like to have you understand that I used the method to pass poor fruit for good fruit. It means this, and no more, that packing fruit has become uniform; practically so throughout the United States, and that uniformity will have to be adhered to.

I made a great mistake in placing in my mind quality against quantity. I prefer to eat a good Rambo or Kinnard. We will never reach the ends of the earth with Rambo's and Kinnards. We must have quantity with best quality possible, under the circumstances, so that more people can use and enjoy apples, if not of the best in flavor.

I, however, believe, that in course of time and events, quality will have just recognition, but alas; too many "maids of Athens" will have passed to obscurity. As a satire on the decadence of quality, the Champion grape has no peer; as a figure, it saith to Moore's Early: "Withersoever thou goest, there will I go; thy price shall be my price." As a destroyer of confidence and consumption of grapes, it is ranking ridicule in its destruction of the virtues.

I will sometime in the future probably be able to note some of my mistakes in apple growing. I look at it now as fortunate that I accompanied all my mistakes with apple tree plantings. I have no license to swing or bury my mistakes, but my apple orchards cover many mistakes that you will never hear of.

Considering my experience with vegetables, and my ventures in other horticultural lines, I know that you will believe me when I say that you have learned of only part of my mistakes.

SECOND ANNUAL MEETING

OF THE

PENNSYLVANIA DAIRY UNION.

PAPERS READ AT WEST CHESTER.

Meeting Held December 5 and 6, 1899.



PENNSYLVANIA DAIRY UNION.

ADDRESS OF WELCOME.

BY HON. C. W. TALBOT, *Burgess, West Chester, Pa.*

Mr. Chairman and Members of the State Dairy Union:

To have with us such a distinguished gathering of gentlemen, representing one of the principal industries of our Commonwealth, is an honor of which the citizens of any community might justly feel proud. I am sure it is a great personal pleasure for me to welcome you to our town and our county, and to assure you of the high appreciation entertained for your Association by all our people. I extend to you a fraternal greeting and express the hope that your deliberations may result in great good to the agricultural interests of our community and that your sojourn among us may be one of continual profit and pleasure.

I understand the purpose of your Association is to improve and develop the dairy interests of our State. With this most laudable object in view, you could have selected no more logical place for your meeting than the borough of West Chester, the metropolis of one of the richest and most productive agricultural counties in our State. You will find one of the many advantages in assembling here, to be the enterprise and liberality with which our daily papers will record the proceedings of your meetings and disseminate the fruits of your deliberations among the farmers of eastern Pennsylvania. This is a feature of vast importance, and should always govern you in the selection of a place for holding your annual gatherings. Your discussions are pregnant with valuable information, which should find its way into the household of every man engaged in agricultural pursuits. The most direct way by which this can be accomplished is through the columns of a live, enterprising, daily newspaper. We have them in this town and we have a community of intelligent farmers who read them, so that you can rest assured the outside world will be fully conversant with whatever you may do here, tending to promote the dairy interests of our State.

The magnitude of the industry you represent is at once apparent when we come to consider the fact that in the State of Pennsylvania there are now in use for dairy purposes (approximately) 950,000 cows, yielding an annual supply of 375,000,000 gallons of milk, from which over 100,000,000 pounds of butter and 5,000,000 pounds of cheese are made. This vast supply of milk, butter and cheese when divided among the men, women and children of the State would give to each one annually about 68 quarts of milk, 20 pounds of butter and 1 pound of cheese. These figures would seem to indicate that the supply of butter, milk and cheese in the State was not sufficient for the consumption of its citizens. It has been estimated that the average consumption of milk per day per capita, in our larger cities approximates one pint. If the same amount is consumed in the country districts, it is clear that the dairy products of Pennsylvania will not suffice a fractional part of the wants of its citizens. The question naturally occurs to our minds, why should milk ever become a drug upon our markets? Why should not the producer—the farmer, receive a more satisfactory remuneration for his product? Why under any circumstances should the producer invest his money, furnish the feed, do the work and labor and pay the expenses of transportation, and receive but little more than one-third of the retail price of his milk, whilst the retailer, without scarcely any capital, labor or expense involved, receives two-thirds of the price received from the consumer? Whenever the producer receives less than one-half the amount realized by the retailer, he is not reaping the just reward of his labor. Every producer of milk should be held strictly accountable for a good, clean, pure, wholesome article, and should be paid a just and proper compensation for the same.

There are some fundamental questions bearing upon the success of the dairy interests of our State, which I have no doubt will receive your attention before the adjournment of your meeting. It is certainly of vast importance that the farmer, who follows dairy pursuits, in the first instance, should be equipped with a dairy of good cows and that he should acquire them at the least possible outlay of money. If there is any particular breed of cows more profitable than another for dairy purposes it should be known. The practical experience of the members of this Association upon this subject would be of vast importance to our dairymen. After the dairy is once established, how should it be maintained—should the farmer buy his cows or raise them? At the lowest estimate, more than two hundred thousand dollars are annually withdrawn from circulation in Chester county and used in the payment of cows shipped here for sale. Eighty per cent. of this stock is bought on credit and the notes carried by our banks. This may be all right for the man who raises and sells the

stock, and the stockholders of the bank who receives the benefits of the discounts on the notes, but how about the farmer who pays the notes and the discounts? Is it a profitable business for him? Would it not be better for the farmer to first provide himself with a good quality of cows, from which he could raise his own stock, keep the two hundred thousand dollars in circulation at home, stop giving notes and paying discounts, and sell cows rather than buy them. The day was, in Chester county when the importation of cows within its borders for sale was unknown. The farmer in those days sold more than he bought, and was usually thrifty and prosperous, notwithstanding the limited opportunities at his command. By raising our own stock, we escape many of the dangerous contagious and infectious diseases which find their way into our State with the importation of cattle and other live stock from distant points, where conditions for the propagation and development of diseases are more favorable than here. Statistics show that heretofore the farmers of Pennsylvania have suffered losses to the extent of over one million dollars annually, the result of shipping diseased horses, cattle and swine into our State.

The question bearing upon the treatment of the cow and the character of the food she could receive to enable her to produce the best results, as well as the handling of the milk in its preparation for the market, are all matters which must be thoroughly understood and carefully practiced, before the dairymen can possibly hope to make his calling successful.

Proper legislation in the interests of the dairy industry should at all times receive paramount attention by all our people, the consumer as well as the producer. Undoubtedly some of our present laws on the subject should be repealed and others enacted in their place. The law restricting the sale of adulterated food should be rigidly enforced and every good law abiding citizen should aid in assisting the proper authorities in faithfully executing them. I can conceive of nothing in the realms of trade that tends so directly to destroy a legitimate business as to permit it to be counterfeited. When we consider the class of men who crowd our legislative halls, the wonder is that we fare so well as we do at their hands, and that many of our laws are not more obnoxious than they are. I would shrink from a suggestion which would tend to promote the enactment of a law which would create any additional salaried officers, for I am convinced that the taxpayers of our State are already overburdened in this respect. Nevertheless, when we come to consider the magnitude of our dairy interests and the facility with which butter and milk transmits the germs of the most deadly diseases to the human body, I am inclined to think the people would be justified in appealing to the Legislature for the enactment of a law, providing for the careful inspection of all

dairies used in supplying milk for public use. In the light of careful and scientific investigation, it has been clearly demonstrated that typhoid fever, diphtheria, scarlet fever and tuberculosis especially are readily transmitted to the human body through the use of unclean and impure milk. Indeed it has been said by an eminent scientist "that probably more deaths occur each year through the drinking of tuberculous milk than would be caused by England's going to war with a first-class power." It has also been proven that the numerous deaths of bottle-fed children are due in large part to putrefactive changes in the milk brought about by bacteria which have been introduced into the milk through careless handling. Chief among these is mentioned the common colon bacillus, which it is said gains access to the milk mainly through the introduction of particles of manure fresh from the body of the animal. The germ of tuberculosis has been found to pass from the milk into the butter and there retain its life for a period of four months. Fortunately it has been demonstrated that the danger resulting from this germ in the butter has been greatly minimized by the modern methods used in this country and Europe, where the cream is separated by a machine and then pasteurized, thereby eliminating from it the germs of the disease, and leaving the butter in a comparatively pure state. A law which would protect the people in the use of milk from diseased cows, filthy stables, unclean receptacles and slovenly men, would be a great blessing to humanity, and I know of no better means of bringing it about than through the aid of the State Dairymen's Association. It will not only protect the public health, but will prove of great commercial benefit to the dairymen. I know of dairymen who now receive as much as ten cents a quart for their milk from their customers, who are privileged at any time to have the dairies inspected by competent parties. I trust this matter, so important to the public, will share in your deliberations. If during your deliberations you can recommend some panacea for the ills to which agriculture has fallen heir, you will be doing an additional public good.

There can be no disguising the fact that agriculture is to-day a discarded and much abused industry. Go where you will, among the farming community and you hear nothing but words of condemnation and lamentation. That most honorable of all the industries, the one upon which our worthy ancestors builded the foundations of our government and which for more than a hundred years has been its mainstay and support, is to-day without scarcely a friend in the land to speak a good word in its defense. Abuse after abuse, and tirade after tirade, has been heaped upon this industry by the very people who should defend it, so that to-day the sons and daughters of the farmer are fleeing from their country homes to take their chances of gaining

a less honorable, less respectable livelihood in the workshops and the crowded thoroughfares of our larger cities, while farm values have shrunk to ridiculously low figures and the social structure of country life almost entirely destroyed and the lands which a generation ago were the hope and the pride of our ancestors, are now occupied by a roving class of tenants. Never since the days of the English feudal system, when William of Normandy introduced the first real estate tenancies, have our lands been so occupied by the tenant classes as they are to-day. Why should this state of affairs exist? Why should not the owner of the farm remain upon it and make the home a bright and happy one, and teach his children the dignity and advantages of an agricultural life. They would grow to become better men and women on the fields of nature than in the workshops and thoroughfares of our larger cities.

Can it be possible that the business of husbandry has fallen into disrepute and that the husbandman himself has determined to stamp it with the seal of condemnation and dishonor? The wealth of our nation was acquired from the soil, and from its products, it has been maintained throughout all the years of its existence. The country districts have furnished the nation with the men and brains, who have moulded its destinies and placed it in the front ranks of the nations of the world. The country home has even been the embodiment of comfort and happiness. Its purity of character and love of virtue have always embellished the lives of its sons and daughters. Can it be possible that, now at the close of the nineteenth century, we are to witness the decadence of this noble institution?

Are not the conditions of to-day more favorable to success in husbandry than ever heretofore? Was there ever a time since our forefathers signed the Declaration of Independence when improved lands could be bought as cheap as to-day, or the rates of interest more favorable to the borrower? Was there ever a time when the family could be clad or educated at so small a cost to the parent as at the present? Was there ever a time when the farmer could do his work at less cost than now? One man with the aid of our improved farm machinery will do as much work to-day as ten men could have done years ago. Did farm products ever sell for more money before the late Civil War than they have sold for since that period? Was there ever a time in the history of our country when five thousand dollars would purchase as much good real estate as to-day? Then why, with all these favorable conditions, is not farming more profitable? To be candid, gentlemen, is not the difficulty with the man and not the business? If the farmer would manage his affairs as industriously and carefully as the banker, the merchant, or the artisan, would he not meet with equal success in his business pursuits?

Another thought to which I desire to refer and I am done. It is a more practical education for our country boys. An education which will not only better prepare them for an agricultural life, but at the same time awaken within them a greater fondness for the same. Our children are now receiving the blessing of an ample education in all the common school branches, as well as the higher mathematics, including hygiene and anatomy and several other branches of study, but aside from these, what practical lessons are they taught, which will prepare them for the life of an agriculturist? None whatever. The mechanic is taught manual training, the engineer, trigonometry and surveying; the soldier, military tactics; the doctor, physics; the lawyer, jurisprudence; the preacher, theology, and the banker, book-keeping and banking. All are educated and equipped in special lines of study, preparing them to discharge the duties of their respective vocations, whilst the farmer-boy is turned loose in the field to work out his salvation in the great workshop of nature, blindfolded and handicapped. His hope and fortune is in the soil, but aside from being able to tell its color, he knows no more about its component parts and the proper food required to stimulate it, than did Solomon know about the modern cake-walk. Agricultural chemistry should be introduced into our common school curriculum, and our farmer boys taught a knowledge of the elements of the soil with which they have to deal; they should know more about plant-life and its relations to the soil. He should be educated so as to be able to thoroughly understand the character of the soil with which is required to work, and if any of the elements necessary to produce his crop are missing, he should be enabled to tell exactly the necessary soil food he should procure to supply the missing elements. In chemistry we learn that fourteen elements are necessary to the production of farm crops, as follows: Calcium, chlorine, carbon, hydrogen, magnesium, manganese, nitrogen, phosphorus, iron, silicon, sodium, oxygen and potassium. What opportunity of education have any of our farmer boys to learn of the value of these elements in agriculture? Until they do have this opportunity, they can never be expected to work the soil intelligently. When they are educated along these lines, farming will become a science, a pleasure and a profit. Our State College is doing a splendid work in this particular, and its wholesome influences are being felt throughout our agricultural districts. If we ever expect to reach the masses, however, we must adopt the study of agricultural chemistry in our common schools. The every-day problems of this life are now worked out upon a scientific basis, and to the swift belongs the race. It is the survival of the fittest, and the man who does not equip himself for the race cannot hope to survive. All honor and all praise is due to the progressive men and women of our country,

who compose the membership of your Association and its kindred organizations, having for their purpose the one grand object of elevation and improving the condition of their fellowman and adding prosperity and wealth to our beloved country.

I again bid you thrice welcome to our town.

RESPONSE TO ADDRESS OF WELCOME.

BY J. L. BRANSON, *Langhorne, Pa.*

I have cudgeled my brain much to imagine why I was selected to respond to the welcome that has been so eloquently extended to the "Pennsylvania Dairy Union," by the honorable burgess of this beautiful and historic town of West Chester. I am not easily frightened, but I must confess to a certain trepidation in speaking here in this town, the very seat and centre of the aristocracy of country gentlemen farmers, and in a county long noted for its intelligent, enterprising and skillful agriculturists, and especially along the line of dairy production.

I remember to have heard in my early boyhood days of Chester county as the home of the wealthiest; the most skillful, the best educated, of the whole brotherhood of farmers, and West Chester as its centre, and the home of its very *elite*. That vision has not been dissipated by close contact and more intimate acquaintance. Travel where you may over the hills or along the valleys, the growing crops, the verdure of the grasses, the sleek, well-fed flocks and herds, the fine mansions and well kept and tastefully arrayed grounds, go to show a thrifty, intelligent, enterprising and industrious population, which goes far toward, if it does not entirely dissipate the prevalent thought that the farmer is a drudge and a drone in the great hive of human industry. I believe more firmly every day, that the farmer is the great moral conservator of the world, that the city is the great plague spot of human life. Almost every evil that invades our country life, is but the breath of the pestilential vapors arising from the evils and the immoralities of city life. If you want to see happiness, as far as human happiness is attainable, go to the homes of the farmers of Chester county or elsewhere, throughout all our broad land, and you find it, and that too of a deep, quiet and solid character, rarely seen inside a city limit.

The present generation of farmers here in Chester county, can look back over the past generations of their ancestors, and see the same quiet, stolid—if I may say it—intelligently persevering, investigating, reading, educated and prosperous people, from the very earliest days of the Republic.

Go out into the Middle Western States where I was born and raised, and you will find the old family names of the farmers of Eastern Pennsylvania and Chester county everywhere, and wherever you find them, you will find men and women of thrift, industry and intelligence, taking the van in all moral, political and industrial work. And gentlemen of the Dairy Union, it is fitting and appropriate that we should come back here to the old homestead, to the place where the dairy interest was swaddled and nursed, that we may draw inspiration from the fountain head. With Chester county before us as an object lesson, it does not require an astute intellect to see that the welfare and prosperity of our country depends more upon the success of its farmers, than the windy oratory of its politicians, or the enactments of its legislature.

Legislation has no creative power, its functions are purely negative. The farmer is the only original creator of a nation's wealth. The dairyman who makes a pound of butter, has added that much to the wealth of the country, and the merchant who sells it is only subsidiary to this.

It is amusing, and in a certain sense ridiculous, when we think of it properly, to see our city merchants modifying the staple products of the farm, and generally by adulteration, and then boasting of some new and wonderful food product. The good old names of "Friend" and "Quaker," so intimately and honourably connected with the history and growth of Chester county, must be disgraced by being appended to some nondescript compound production of oats, and probably guiltless of any of the cereal. Then, who does not call to mind the toothsome buckwheat cakes of our mothers and grandmothers, covered with Orleans molasses or maple syrup, but the enterprising merchant has ignored the snow-white and honey-scented buckwheat patch, and has made a compound of "middlings" or offal of the flour of wheat, or some other cheap compound, and we eat it as "Hecker's Self Raising."

You know how this comes in with relation to butter, with its imitations, and along the whole line of foods we eat, till the modern manufacturing chemist, like the magicians of Egypt in the days of Moses, seek to imitate the Almighty Creator, in all the productions of the soil. Putting chemistry on one side, and legislation on the other, the poor farmer is being literally shot to death between the lines.

It is for the discussion and eradication of evils, that surround the dairy industry of our Commonwealth, that the Pennsylvania Dairy

Union has been formed, and I thank you Mr. Burgess on behalf of the Union, for your words of welcome. We hope our stay with you will be pleasant and not unprofitable, to all concerned. It is a privilege to meet here, and the pleasure has been enhanced by your words of welcome.

Again, I thank you on behalf of the Union.

PRESIDENT'S ADDRESS.

In making this, my second annual address, let me congratulate you that you have been invited to meet in this place, for while I have no statistics to back up my assertion, yet I believe there is no county in the State having so large a proportion of her farmers intelligent dairymen as Chester county. This county has long been famous for the great number of registered cattle within her borders, and the prices obtained by some of the Chester county farmers for their milk and butter, have seemed fabulous to many of the rest of us. Near here also is one of the first factories for utilizing skim milk by drying the curd, and also probably the largest factory in the world for making separators, which separate so well that the skim milk is too poor to be worth much except for drying out for curd.

Two years have rolled by since we were first organized, and during the past year, the Angel of Death has taken Mr. J. G. Haldeman, one of our Board of Directors, from us. He was a thorough gentleman, loyal to the State, loyal to the profession of agriculture, and loyal to this Union. Whenever our Board of Directors met, he was there; but we trust he has passed on a little before us, and is reaping the reward of faithfulness and duties well performed. I said "profession of agriculture," is that a correct phrase? As applied to the members of this Union, it no doubt is, but to many farmers, I fear it is not, for the slipshod, haphazard way their farming and dairying is done, and the poor results following their efforts, proves they are not educated enough to profess much of anything.

Three words, you remember, express the object of our Union: "Co-operation, Education and Legislation." Beginning with the last named, legislation, your Secretary has told you what we have accomplished. As there is no regular session of the Legislature this year, we only need to help our Dairy and Food Inspector to enforce our present laws, at the same time, doing all that we can to see where they can be improved. You instructed our legislative committee, last year, to have a bill passed in regard to the proper marking of cheese, but it was a hard task to get any legislation last winter whatever, and the bill was not reached. The other bill you instructed us to have passed, in regard to the use of milk bottles stamped with the owners name, was passed, but failed to receive executive appro-

val, as it was considered that we already had an act covering the case.

I trust each of us will help give information where we suspect oleomargarine, process or renovated butter is sold. If anyone doubts the magnitude of this industry, let him come in contact with the lobby the makers of oleo employ. The present is not a very bright time for the general dairyman, nor has the past summer been so. Most of the States suffered at one time or another from severe drought, which not only made pasture very short, but in many sections diminished the hay crop one-half. Almost all feeds are from twenty-five to fifty per cent. higher than last year. Cattle are high, and good ones very hard to find, at any price, yet dairy products have not advanced in proportion. Unless our farmers learn the value of co-operation, they are doomed to forever follow the thorny and discouraging path they are now treading. Especially does this apply to the sellers of milk. How many of you with your increased feed bills, are getting any advance for your product? Each year more is demanded of you. Where you used to get four cents per quart for milk with three per cent. butter fat, and no questions asked as to how many microbes you were furnishing free, you now are fortunate if you receive three cents for four per cent. milk, and are all the time in danger of indictment for manslaughter by the grand jury, of doctors and health inspectors, because don't you know that consumption, tuberculosis, hip disease, white swelling, scrofula, stiff knees, short limbs, club feet, typhoid fever, scarlet fever, diptheria and measles, and lots of other ailments are caused either because people do or do not use milk, even alcoholism, which kills its millions, is caused by people not using milk instead of rum. All who produce milk should exercise the greatest care to produce a good, wholesome article, and then you should combine, that is, co-operate, and demand better price for your goods. On the farm where I live and grow milk, milk production and the delivery of it to families, has been followed for over fifty-two years, by myself or my ancestors. Therefore, I feel that I know both sides of the question; the selling of it as well as the making of it, and I am free to say that the farmers should always have net, above freight, one-half of the retail price, and the middleman has generally the best half of the business. If I had to take the low prices prevailing for the past few years for milk, I would very soon let some other fellow raise the milk, and I would do both the selling and the money making.

Again, if we do not learn to co-operate, in many places our business will be run for us by theorists or busybodies, or boards of health, acting, not for the public good, but to carry out some hobby at our expense, or else to maintain themselves in office. I am glad to say these remarks do not apply to the Pennsylvania Live Stock Sanitary

Board; they are conservative and wise. But there is a constant effort to pass unjust laws and municipal ordinances, which would make it impossible either to sell or to grow milk at a profit. Impure, diseased, tainted or adulterated milk, or any other food, should never be sold, but while educating ourselves to produce a good article economically, we also need to co-operate to protect ourselves from unjust demands. Allow me to say that these remarks are my honest convictions, the result of much thought, and I have not been driven to them by any unpleasant experiences, for I have never had an animal condemned, or a quart of milk confiscated by the authority of any doctor or health officer, but I have seen the flower of other herds murdered, when the post-mortem only showed some little nodule that probably never, and certainly not for some time, could have prevented such animals from producing healthy, valuable offspring, and also wholesome milk. I have no objection to a regular inspection by our State Live Stock Sanitary Board, and I am willing to advocate such a measure, and that all animals which a good veterinary surgeon condemns by physical examination as unfit for use, be removed at public expense, as it is for the public good. But let us be on our guard against municipal inspection, which will be apt to be an ignorant and superficial inspection.

Again, let our Union convince our smaller dairymen of the value of co-operative creameries and cheese factories. A few farmers can generally, by combination, make much more for each other, than they can by each doing the work alone. From two to four dollars per ton can often be saved by purchasing feed in car load lots; learn to watch the market, and when you see anything you need, low, join with one or more of your neighbors and buy by the car load. If we can educate our people to first grow all they can in an economical manner and then to cheaply buy such feeds as are needed to make a balanced ration, we will have accomplished a great work. No other industry stands such ignorant waste, and as ignorance is generally wilfulness in this day of Institutes and Experiment Station bulletins, I may say, such wilful waste as ours. The majority of cows are annually bringing themselves in debt and should be eaten instead of being allowed to eat, and in this and many other ways, must we follow up the educative part of our work. Another thing for us to do is for each member to get his neighbor to join us, both for his sake and ours. The Treasurer will tell you why for our sake.

I believe there is a better day ahead for the dairymen. People are learning the value of dairy products as food. The price of fat cattle is helping us to get rid of our poor cows. Everyone is busy and has money to buy with, and the increased yield obtained by scientific feeding and breeding adds to our profits. Let our Union forge ahead with the wave of prosperity which is so manifest in other lines of business,

and I am convinced we can be the adjunct the dairymen have longed for to guide and direct them also into the same path.

At the close of the President's address the following gentlemen took part in the discussion:

Mr. Edward Walters.—The President states that three words express the object of our Union: "Co-operation, Education and Legislation." I think instead of legislation, should be the word non-legislation, for the simple reason that nearly all the legislation for the past two years in connection with our interests has been detrimental to the interests of agriculture. Co-operation is rightly placed first; for if all of the farmers of Pennsylvania do not co-operate all of our effort amounts to nothing. The trouble is that we do all see through the same set of glasses. The President's address is one of the ablest I have had the pleasure of hearing in the interest of the farmers.

Mr. George Maloney.—I was much interested in the allusion of the President to the farmers raising stock, and in regard to the slaughtering of stock. I have no doubt but that many cattle have been destroyed that might have been instrumental in building up the herds. There was an interesting bulletin issued, I think, by the Wisconsin Experiment Station in reference to the building up of dairy herds from animals known to be tuberculous. The results were shown to be very satisfactory for breeding purposes. There seems to be a general sentiment that there is much danger of contaminating the human species by milk from the tuberculous animal, and I think we want to take some action to correct that impression. I think there is comparatively little danger compared with the amount of advertising.

Mr. Edward Walters.—This is a subject in which we are much interested, and there are men here who can talk upon this subject, and who have different opinions from those expressed by these gentlemen who have spoken. We are here for education and information, and we will not spend our time right if we do not discuss such subjects, and I trust the matter will not be dropped.

Mr. J. L. Branson.—I think one thing that ought to be thought of and talked about, is the raising of our own calves. I think we hardly appreciate how much we lose by continuously buying from the merchant and cattle dealer, stock to recuperate our farms. One of the great secrets of the dairy industry lies in that one thing. If we raise our own stock, we have to be more careful in our attention to them; it teaches us to be familiar with them. It requires care and skill to successfully raise young stock, and we get into the habit of caring for them, and there is less chance of disease in our herds. I have not noticed that the men who raise their own stock are usually the most successful dairymen. I believe this matter ought to claim a great

deal of attention. By depending upon the auction sales we always get the poorest animals. For many years I have raised every heifer calf, and have never received less than \$50 for a young heifer. People buy them because they know they have been raised correctly.

Mr. Austin Leonard.—I agree with the remarks of Mr. Branson about raising our own stock. We have, of necessity, to do it in the northern part of the State, for we cannot go out and replenish our herds from our neighbors, and so resort to nature's plan and propagate our dairy animals.

I do not know but what we are glad of what you people are doing. After having developed a cow and we observe her, we know whether we want to keep her or not, and if we do not, and some one wants her, we are very glad to let her go for what she will bring. Very likely the man who gets her doesn't make a fortune, but you have this advantage, you raise great quantities of corn and by stimulating that cow, if she will not make milk she will make beef, and she will go where she belongs, and you have done us a favor. We don't want you to raise all your cattle; we would rather sell.

One of our dairymen in 1893, kept a record of his herd. The production was 4 pounds of butter to 100 pounds of milk. Since that time new blood has been introduced, and probably some new methods of caring for the stock, and this year is over 6 pounds of butter to 100 pounds of milk. The cows in that herd were not bought except some foundation stock, and they have been improved by the use of males from imported herds. If you gentlemen can buy stock that has been raised in that way you can afford to pay good prices.

Mr. A. Billings.—I would like to ask whether it pays the gentlemen to raise their cattle. In Erie county the people who are selling their milk are making more money out of their business than we are where we have to make butter on account of being at a distance from a market. They are also making their money easier by coming back to us and buying animals, because by buying a fresh cow they know just what they are getting out of her, and when it is not profitable to sell milk they can turn the animal over to the butcher, who is glad to get such animals.

Mr. Cutshall.—The proposition that the farmer raise his own products for his herds is something that needs to be emphasized. The farmer that sets out to make a study of how to buy something cheap which he can produce on his farm is making a mistake. We ought not to do so much farming by proxy. It is only when we cannot produce those things that we need that we should think of buying.

The matter of buying, and of raising cattle in every locality is different. In Western Pennsylvania the animal can be produced cheaper than in Chester county.

Mr. H. Hayward.—I should like to ask if any one can give definite figures of the cost of raising a heifer until two years, when it pays for itself.

Mr. J. L. Branson.—I never kept an actual account of raising calves, but a man can always have a general idea about the expense of anything without making figures, and I have always thought that if you can sell a heifer after two years for \$40 or \$50 you would perhaps more than double your money. The calves can be fed on skimmed milk, and a little later, bran, and when they can go to pasture they get nothing but that. In the winter they have cut fodder, bran and meal, and should be kept in a warm place, which saves feed. Nothing I did on a farm paid as well as raising heifer calves. I never had an unhealthy calf and never one that was said to be a poor one. They are better than the ones you buy. I believe farmers make a mistake in trying to make merchants out of themselves. Farming is the basis of everything on earth. The machine wears out, but the farms never do; they are the same old farms that were owned by our ancestors. Go into the city and what do you get that is not made from the farm. Everything comes from the farm, and the farmer ought to be independent and ought not to try to become a merchant. Raise your stock and feed them on the products of the farm and you will have less tuberculosis.

Mr. Samuel Howell.—In reply to the question of the cost of raising a calf until it was two years old, I would say that two years ago I had occasion to raise a calf. It was optional with the owner whether he took the calf back or let it remain. If he took it for his own he was to pay for the raising, and for that reason I kept an account as nearly as I could. She was fed as the gentleman from Bucks county has outlined. At the end of the two years the owner concluded to take her, and I rendered a bill of \$24.50, which was as near as I could figure the cost.

Mr. Milton Darlington.—I would like to speak of the danger of having a veterinarian examine the herds. In one case of seven cattle examined, all had to be killed, and I subsequently learned that only one or possibly two ought to have been killed, so that there were five cows lost worth at least \$225.

Mr. P. C. Sharpless.—I approve of raising all we can and in practicing economy, but I do not think we should narrow ourselves down to this thing of not buying. We buy through our brother farmer; we are helping one another, and the only things we do not buy are the ingredients that go to make up these adulterations that the chemist is blamed for. If we buy a certain kind of food, we buy of some other man who under different conditions can produce that cheaper than we can. We only buy from the producer. There may be a middle

man, but that is because we are not organized, and I maintain that the farmer should not stop at mere production, but should follow the product to the consumer. We use every effort to have good milk, but if the dealer put it in a dark cellar it will not be pure. There are no microbes in our springs, but in the city milk shops, and it is our duty after we have produced an article to see that it reaches the consumer in proper condition.

Mr. Artman.—With reference to the remark just made that all the microbes are in the city stores, I would like to ask some creamery-man here if that is correct.

Mr. George C. Cornell.—I guess they are everywhere present.

Mr. H. W. Comfort.—In regard to the matter of raising calves, I cannot see how it can be done so cheaply as has been here stated. I cannot do it, and yet I think it pays me well to raise my calves.

Some years ago we were able to go to Bradford county and say to a man, what will you take for 6, 8 or 25 of your best cows, and he would say that you could have your choice for so much; but the time has now gone by when we can have our choice. Some of us have been driven to raising our own calves. Some of us have no milk, and it costs us more for raising, but even if it costs us \$40 to raise a calf, that heifer is a better cow with her first calf than the average cow bought for \$60 or \$65 at public sale with her third calf.

Mr. Joseph G. Williams.—I cannot recall a farmer but has raised several heifers this summer. I think they have been driven to it because they cannot buy cows that suit their purposes at any price. It is almost impossible to get first class cows from drovers which are brought here.

THE RELATION OF THE COMMISSION MAN TO THE CREAM-ERY-MAN.

BY W. F. DRENNAN.

In justice to myself, I would like to say that when invited to speak I absolutely declined except in a very brief way. The subject appeared to me to be somewhat barren, as it would present itself to any one. There are some features, however, that will bear discussion. If I had been invited to address an audience of western shippers and dairymen I would have felt somewhat more at home for the reason that as a commission merchant we have never yet been able to estab-

lish near relations with the nearby shipper of Pennsylvania for very good reasons—for the last one hundred years I suppose the dairymen of Pennsylvania of the near-by districts have been making butter for the Philadelphia market, and naturally they had no use for the commission merchant.

The commission merchant of Philadelphia is an institution of rather recent date. The process of marketing the dairy products of this end of the State has been the very simple one of taking the goods to market either by wagon or express, and putting them into the hands of the consumer or retailer. As our market enlarged there appeared to be room for the commission merchants to handle butter with other things; and as it appeared impossible to do much business with the Pennsylvania shipper we looked for our business from a distance, particularly in the West. I might stand and talk to you for an hour or two and relate my experience in attempting to establish business with the Pennsylvania shipper, and I think my experience has been the experience of nearly all the commission merchants of our city. There is no thought to blame them for this state of affairs whatever. It is perfectly natural for the Pennsylvania shipper to find the best market at the lowest cost. He will sometimes tell you that he is distrustful of the commission merchant; he may have very good cause to be, but I think it will scarcely be wise for one class of men to call another class dishonest; the percentage of virtue in one is about as great as in the other. The result is that the commission merchant has had to look for his business outside of this State, and for that reason it is very difficult to talk on this phase of the subject.

But there is a broad ground on which we can come together. An effort to maintain our market and keep it open to the pure dairy products and solidly stand together in enforcing our laws regulating the sale of spurious butter, oleomargarine and kindred products. This is a field which I would like to see discussed here to-day.

There are people here familiar with the subject, able to give you light, and to make suggestions which will be of great use to you. The Dairy Union, while I have been a member of it but a short time, appears to be a nucleus around which every dairyman and creameryman in this State can rally. It is strange to me that there is not more interest manifested in this dairy industry, which probably is second to no other industry in the State. I am surprised too that there is not more co-operation between the commission merchant and the creamerymen of this State in the enforcement of the laws regulating the sale of these spurious products. I exempt the men who have shown much zeal and given liberally of their funds, but they are few compared with the vast numbers of dealers throughout the State.

I think this meeting is the time when some direct effort should be formulated.

I do not feel prepared to give a synopsis of what is being done by the Pure Butter Protective Association, as has been suggested, but can give some general outline. This meeting may not be a proper place to discuss the subject, as we commission merchants would feel like discussing it. We have been waiting for the State authorities to enforce our law. We waited all last winter, and when I do not say they were not attempting to enforce it, we found it impossible to do very much through that medium, and the commission merchants of Philadelphia last March organized the Pure Butter Protective Association. We pledged ourselves to the amount of \$1,500 and set to work to try to enforce the law. We thought it best to secure as many cases as possible before much noise was made about our effort. By the time we were ready for the prosecutions, the courts were about ready to adjourn. A new law was being formed and we were assured it would be passed in the Legislature of this State. Therefore, our spring work with about 200 cases of violation appeared a little like time and money thrown away. Since the passage of the new law we have kept up the fight. About a dozen commission merchants, with a few creamymen, pledged ourselves to funds with which to pay the running expenses. We employ one attorney, two detectives and a constable. I expected Mr. Kauffman here to-day to show you what was being done, and the prospect for vigorous continuation this winter. The work is being pushed with every possible energy as far as our funds will go. The courts have been very slow in bringing the cases up. A few convictions have been secured, and there are probably now a hundred cases pending. In a general way, that is about the situation.

OUR DAIRY LAWS AND THEIR ENFORCEMENT.

BY MAJOR LEVI WELLS, *Dairy and Food Commissioner, Harrisburg, Pa.*

"Our Dairy Laws and their Enforcement" is the subject assigned me to present to this assembly of practical, and, I believe in the main, successful Pennsylvania dairymen. I am glad to meet you face to face, and hope to form personal acquaintances that may prove mutually pleasant and profitable. This convention represents the greatest agricultural industry of the State, with its million cows, and

an estimated annual product amounting to fifty million dollars. We have about one thousand creameries in the State, and the total investment of dairy capital in Pennsylvania, including real estate, cows, creameries and dairy fixtures, will aggregate over two hundred and fifty million dollars.

To prevent fraud and deception, the law-making powers of the State have, from time to time, enacted statutes to prohibit and control the manufacture and sale of imitation dairy products. For the purposes of this discussion it is unnecessary to go back later than the act of 1885, which absolutely prohibited the manufacture or sale of oleomargarine in this State. From 1885 until 1893, a period of eight years, there was no one whose especial duty it was to enforce this act, and the consequence was that violations were frequent and no particular attention was paid to them. In 1893 the Legislature passed a law creating the office of Dairy and Food Commissioner, as an agent of the State Board of Agriculture, whose duty it was, under the direction of that Board, to enforce the then existing laws governing the sale of so-called dairy products. The incumbent of that office took hold of the work and no doubt did the best he could, with the means at his command, to prevent the sale of oleomargarine, and carry out the provisions of the act of 1885. He was not, however, wholly successful in accomplishing the work, and in many sections of the State, where there seemed to be a demand for oleomargarine, considerable quantities of it were sold contrary to law. It was also manufactured quite extensively in the State until late in the season of 1895, when the last factory, located in Philadelphia, was closed. Since that time, no oleomargarine has been manufactured in this State, except such as has been carried on surreptitiously by creamerymen who were supposed to be making genuine butter, and this, I am satisfied, has only been practiced to a very limited extent. The manufacture of oleomargarine is carried on principally in the western States, mainly in Chicago. There are also plants in New Jersey, Rhode Island and Connecticut, and possibly in other eastern States, where oleomargarine is manufactured.

In 1895, a Department of Agriculture was established in this State, with a Secretary and several sub-divisions, with a chief, or head, to each division, among them that of Dairy and Food, and by this act the Commissioner became responsible to the Secretary of Agriculture, and was required to work under his direction instead of that of the State Board of Agriculture. Various other laws besides those pertaining to the sale of oleomargarine were enacted, relating to the sale of food products generally, and their enforcement was placed in the hands of the Dairy and Food Commissioner, so that the scope of his work was greatly enlarged at the time the Department of Agricul-

ture was established. From that time a vigorous attempt was made to prohibit the manufacture and sale of oleomargarine in this State, and so far as manufacturing was concerned, the effort was entirely successful, as the last and only factory was compelled to close its doors in the fall of 1895, and none has been manufactured in the State since. In many sections, covering the larger portion of the State, the vigorous policy then enacted was entirely successful in wholly preventing the sale of imitation dairy products, but in other sections, including the two large cities and the mining regions, where the foreign element largely predominates, its sale was never wholly suppressed, though greatly restricted. Oddly enough, the first two prosecutions brought by me were in two leading dairy counties, Bradford and Chester, and I do not think oleomargarine has been used, or kept for sale, in either of these counties since. The same results were obtained in nearly the whole State, outside of the sections formerly mentioned, and constant inroads were being made and the traffic greatly reduced in these sections.

An adverse decision of the United States Supreme Court handed down in May, 1898, about killed our prohibitory law. This decision was based upon what the court claimed to be the fact that oleomargarine was a legitimate article of commerce, both foreign and domestic, and that as such it had its legal rights under the Inter-State Commerce act of Congress, and that no State laws could conflict with its provisions.

The effect of this was at once to give a wonderful impetus to the traffic in oleomargarine in Pennsylvania. Large wholesale concerns that we had driven from Philadelphia to New Jersey, re-established their business in this State. Our law had been pronounced unconstitutional, in so far as it related to the sale of an unbroken, original package, and the size and weight of what might be called an original package was not limited by this high tribunal. Our State was flooded with agents of the oleomargarine manufacturers, who endeavored to make dealers believe that under this decision they could lawfully sell it in any way they pleased, and where cases were brought to court, two of our judges ruled (though as we believe erroneously), that this decision extended to and covered the retail trade.

Such, gentlemen, were, in brief, the conditions that confronted us at your last annual meeting, and your body appointed a committee to take up the subject, and in conjunction with a like committee from the State Grange, to recommend some line of action. After due deliberation and careful study and preparation by this committee, our present law was formulated and successfully engineered through both houses of the Legislature, and was approved by the Governor in essentially the form it left your committee.

This act was approved May 5th, 1899, and went into immediate effect. As soon as it was possible to prepare the plates, forms for licenses were printed, and we began issuing them early in June, and up to the present time 395 licenses of various kinds have been issued and \$19,014.00 have been paid into the State Treasury from the same.

The anti-color clause of the law has been the principal bone of contention. It was averred by parties interested in the sale of oleomargarine that this part of the law was unconstitutional, and court decisions in various States were cited to sustain this conclusion. At the present time Illinois, Maryland, Michigan and Minnesota have, by various courts, decided adversely against its constitutionality. So far as I know, the legal talent in our vicinity is about equally divided on this question. A decision of the courts that would settle the question in our own State seemed to be desired by all parties, and two test cases were instituted some time ago. One in Philadelphia and one in Pittsburg are now pending, and it is hoped that a speedy decision may be secured. The question was early raised whether prosecutions should be multiplied on this color issue. It was a question that I felt some hesitancy in deciding, and those higher in authority than myself were consulted, and the conclusion was reached that it was not advisable to multiply cases on this part of the law, for the reason that the two cases pending would determine the question as well as two hundred would, and that a large amount of litigation and heavy costs, that possibly the State might have to pay, would be avoided. So far as displaying the signs required by law, that "oleomargarine," or "butterine is sold here," has been very generally complied with. Many of the dealers, however, seem inclined to continue to sell it as butter, and to prevent this deception, as far as possible, has been the aim of this Department. Numerous prosecutions have been brought, which in most cases are now pending in the courts. In Lackawanna county, a case in which the most positive evidence was presented to the grand jury, that the law was violated by a failure to stamp the wrapper as required, resulted in their ignoring the bill. The same grand jury ignored a bill against another party, where the offense was selling phosphate of lime for cream of tartar.

It is a little discouraging to meet such obstructions in the enforcement of our pure food laws, but I am happy to be able to state that grand juries of this particular stripe are not very numerous in Pennsylvania. I think it has been pretty clearly proven by the operations of our present law, that there is no very extensive demand for oleomargarine, when sold as such. The great fraud has been in palming it off for butter, and obtaining for it butter prices. Our present law, even should the anti-color clause be pronounced unconstitutional, will, if rigidly enforced, prevent this deception,

Our butter market at present is in a very satisfactory condition from the producers standpoint. Consumers probably consider present prices extremely high. I suppose in Philadelphia to-day it would hardly be possible to buy at retail a pound of choice butter for less than thirty-five cents.

If this Dairyman's Union can so interest and instruct the dairymen and dairy women of the State, that they will put their milk, cream, cheese and butter on the market in the condition, and of a quality that it could, and should be, the gross product of our million cows would be increased in value fully ten dollars a head, increasing the revenue from our dairy products an amount equal to the appropriation for our public schools. More than this, if all the butter was made of the quality it might be, and should be, it would do more towards settling the oleomargarine and the renovated butter question than all the legislation on the statute books. Oleomargarine never has and never will displace high-grade butter any more than calico will displace silk. Oleomargarine comes in competition with low-grade butter, and is considered by many consumers preferable to it. When no poor butter is made, will be the dairymen's millenium, and when it shall come, rests wholly with dairymen to determine. Then there will certainly be no renovated butter, for there will be nothing in the shape of butter that needs renovating. This question is largely an educational one, in which this organization will likely play a most important part. I very well remember when, more than forty years ago I was in the A B C of dairying, that such men as Horatio Seymour, Ex-Governor of New York, and afterwards a Presidential candidate, and X. A. Willard, of New York, were actively engaged in the work you are doing, and that I considered that time and money was well expended in attending the Dairy Union they were interested in, and that the information there received has been of the greatest value to me, as it was to hundreds of others, who were benefited by that organization. I throw this thought in here hoping to stimulate and encourage you in the great work you have undertaken, and hoping that great benefit may result from your efforts.

Our cheese law of June 23d, 1897, while not entirely satisfactory in every particular, may be considered very much preferable to no law regulating this important part of our dairy products. It makes five different grades, which I think is entirely too many. Two, in my opinion, would be better, namely "Full Cream" and "Skimmed Cheese."

While there are various grades of skimmed cheese, yet it might as well come under one general class. The quality and prices of skimmed cheese would regulate themselves. The better qualities

would command the higher prices, and were it all sold under the one brand neither the producer or consumer could be injured. There was a bill introduced before our last Legislature which was intended to remedy the defects of our present law, that I think would have met with little or no opposition, but it was not sufficiently advanced on the calendar to be finally acted upon before the early final adjournment of the Legislature, and it fell, with many other bills for this reason. It can be said to the credit of Pennsylvania cheese makers, that it is a very rare occurrence to find a Pennsylvania full cream cheese that is not up to, or above the legal standard of 32 per cent. fat. Our agents, however, do find on our markets considerable Ohio cheese that is branded and sold as full cream, that is partially skimmed. One wholesale dealer in Pittsburg seems to have distributed a large quantity of this cheese in violation of the law, and our agents have brought prosecutions whenever they find it. If the courts in which these cases are now pending do their duty and impose the fines the law provides, the fraudulent practice will soon be broken up. Since the passage of a national law imposing a tax on filled cheese, our markets have been kept pretty clear of that article.

One of our agents in Philadelphia has recently found some foreign cheese of Italian manufacture that contained foreign fats, and was not made wholly from milk. A prosecution is also pending in this case, and a conviction is expected. It is a gratifying fact that under our present law, Pennsylvania full cream cheese is steadily gaining a reputation in our markets second to none, and if our manufacturers are vigilant and true to their best interests, New York and Wisconsin will have to look well to their laurels or Pennsylvania will be wearing them.

I was particularly well pleased to learn recently from an extensive manufacturer in the north-eastern section of the State that our cheese law had been of great benefit to him and that Pennsylvania full cream cheese was in demand and went anywhere at highest quotations, and that it was preferred by many customers to other brands, that formerly he had to send it over the border and get a New York brand on it to dispose of it advantageously.

It is of the utmost importance to our cheese industry to see that the quality is right and true to the brand, and we will have a reputation for Pennsylvania "Full Cream" second to none. At present quotations, cheese making is a very profitable dairy industry.

An act to prohibit the adulteration or coloring of milk or cream by the addition of so-called preservatives, or coloring matter, approved the 10th day of June, 1897, was, in some way, changed by the addition of the letter "f" to the word "or," making "for" out of it. Whether intentionally, or by accident, I do not know, but its effect

was to destroy the usefulness of a good law. The first section as submitted to the Legislature read "Be it enacted, &c., That the sale, or offering for sale, of milk or cream for human consumption in this Commonwealth, to which has been added boracic acid, salt, salicylic acid, salicylate of soda, or any other injurious compound or substance, or artificially coloring the same, shall be a misdemeanor, &c." The substitution of the one letter made it read "for artificially coloring the same." As none of the acids named have any coloring properties, it can readily be seen that substituting this letter, destroyed the law, as it would be claimed that these preservatives were not added for coloring, which is all that is prohibited as the law reads.

We have no general law governing the sale of milk in this State, neither do we need any, as our pure food law answers every purpose, whenever it seems necessary to bring prosecutions for the sale of adulterated milk.

Juries are more at fault than are our laws, as is evidenced by a case in Schuylkill county a few days ago, where they acquitted a man who sold milk to which had been added boracic acid and twenty-five per cent. of water. Another jury in the same county cleared a man who sold pepper that contained seventy-five per cent. of ground cocoanut shells. One might infer that adulterated food was at a premium in that county, and that boracic acid in milk can be fed with impunity to sickly children.

Last, but not by any means least, on the subject of dairy laws and their enforcement, comes the one approved May 4th, 1899, regulating the sale of renovated butter.

Some three years ago I became satisfied that a great fraud was being perpetrated upon consumers and upon legitimate dairy interests by the sale of this renovated butter. Two large plants were in operation in our State, and besides a large amount put on the market from these home establishments, hundreds of tons from western concerns were annually shipped and all sold as creamery butter. An attempt was made to handle the matter and require it to be sold for what it was under our Pure Food Law. The matter was given a great deal of prominence at the National Meeting of Dairy and Food Commissioners of 1898. As a result of the work started here and carried on at that National Meeting, seven dairy States, besides Pennsylvania, now have laws governing its sale. In six States the laws require it to be branded "Renovated Butter." One State allows the choice of "renovated" or "process," and one requires it to be branded "Process Butter." These laws will, I believe, have a tendency to greatly benefit legitimate dairy interests by suppressing the sale, to a great extent, of this apology for creamery

butter. It has been a great menace to the dairy interests of this country, not only by taking the place of genuine butter, but efforts have also been made to establish in foreign countries a sale for it as genuine American butter. The effect of this upon our foreign markets would be as disastrous as was that of filled cheese, which, as everyone knows did incalculable damage, and nearly ruined our one extensive English market for American cheese. I cannot better describe what this so-called "process butter" is than by reading an extract from my report for 1898, describing what it is and how produced:

RENOVATED BUTTER.

(EXTRACT FROM ANNUAL REPORT OF THE DAIRY AND FOOD COMMISSIONER FOR 1898.)

"It may be of interest to many to know what renovated butter is. It is also known under several alias, such as 'boiled' process and 'aerated' butter, and is produced from the lowest grade of butter that can be found in country stores or elsewhere. It is of such poor quality that in its normal condition it is unfit for human food. It is generally rancid and often filthy in appearance, and of various hues in color, from nearly a snow white along the various shades of yellow up to the reddish cast or brick color. It is usually packed in shoe boxes or anything else that may be convenient, without much regard to cleanliness or a favorable appearance in any way. The merchant is glad to get rid of it, with its unwholesome smell from his premises, at almost any price, usually expecting that it will find its way to some soap factory, where it naturally belongs; but in this he is mistaken.

"We have in our State two extensive plants using large quantities of this original stock, and converting the same into what is often branded and sold for creamery butter. It is first dumped into large tanks surrounded with jackets containing hot water, and melted at a temperature ranging from 100 to 110 degrees Fahrenheit. After being thoroughly melted, the heavier solids sink to the bottom and the lighter particles rise to the top, which, when skimmed off, leaves the clear butter fat with the heavier sediment at the bottom.

"This butter fat is then removed to other tanks, jacketed and surrounded with hot water like the first. The odor of the fat at this stage is anything but agreeable, and the main object of the next

manipulation is to remove this stench from it. This is supposed to be accomplished by aeration, the fat passing out of a pipe at the bottom of the tank, and with a rotary pump it is again elevated in a pipe over the top of the tank, and discharged through a strainer into the same, thus, to remove the disagreeable odors, keeping up a continuous circuit and agitation of this liquid butter fat. It is claimed by some that chemicals are also used for this purpose; but I have been assured by parties who are engaged in the business that this is not true. When the fat is sufficiently aerated the machinery is changed by removing the funnel-shaped strainer, and large quantities of skim milk are added; in just what proportion I am unable to state, but can approximate very nearly the amount. An analysis of the finished product showed only 75 per cent. of butter fat, and as it contained nothing but the fat and milk and a small amount of salt, there must have been about 25 per cent. of milk added. A perfect emulsion of the milk and butter fat is obtained by the same machinery that did the aerating, excepting the strainer, and it is accomplished in a very short time. When the milk has all disappeared the melted mass looks much as it did before the milk was added.

"It is next run off in pipes to a vat of ice and water, where it is quickly chilled, taking the granular form, and looking like ordinary butter, when in the granular form before being worked. It is then worked, salted, if necessary, and printed or packed in tubs for shipment, often as fresh, creamery butter."

"I do not know how a greater fraud could be perpetrated upon the unsuspecting consumer or upon legitimate dairy interests, than is done by these manufacturers of spurious butter. In the first place, 25 per cent. of the compound is skim milk, for which the consumer pays the price of butter. Besides this, the filthy condition of the foundation stock before any manipulation occurs, were it known, would deter most people from eating it. It certainly should only be allowed to be sold for what it is, namely 'Renovated Butter.' It is a fraud because it has no keeping qualities. Being so heavily charged with skim milk, unless kept at a very low temperature, it soon becomes putrid. The manufacturer and jobber may get it off their hands before it deteriorates, but before it gets to the consumer, usually "its last estate is worse than its first."

DISCUSSION.

Mr. Joseph Sharpless: I would like to ask Major Wells if any convictions have been made under the present oleomargarine law.

Major Wells: Those cases stated in my paper are actually pending in court. I have not the data here to state whether convictions have been made.

Mr. Thomas Sharpless: I would like to ask what effort if any has been made on the part of the Department to enforce the law. It is an open secret that oleomargarine is sold in Philadelphia in violation of the law at the present time, and we want to know whether any effort on the part of the Department to enforce the law independent of the color clause has been made.

Major Wells: There have been some cases brought in Philadelphia by the Department which are now pending before court. -

Mr. Sharpless: Would the Department be willing to accept evidence gathered by others than those connected with the Department.

Major Wells: The Department is willing to accept any evidence that is truthful.

Mr. Kaufman, Attorney for the Pure Butter Protective Association: Since 1885 we have had in Pennsylvania a protective law which absolutely forbade the sale of oleomargarine in any form. That law was repealed largely owing to the influence of this Association; and it ceased to be a law on the 5th of May of this year, and you have now a law which permits the sale of oleomargarine, provided it is sold as such, marked "oleomargarine," or "butterine."

The sale of oleomargarine can be regulated in Pennsylvania, but to do this there are three essentials: The will to do it, the knowledge of how to do it, and the means with which to do it. It is quite possible with these means to so regulate the sale of oleomargarine that it will become an unimportant factor in the competition with pure butter. I take it for granted that the Department of Agriculture, under the present law, has the means; it didn't have under the old law. I assume that the Department of Agriculture has the will to enforce the law, and there ought to be enough attorneys in the State who know how to do it. There is no reason why the present law ought not to be enforced. As attorney for the Pure Butter Protective Association, in less than 30 days we had more than 100 cases. Major Wells admitted to me that he did not have the funds to get the evidence. This is a statement which was correct, because the Legislature has treated this association very meagerly. We, however, got the evidence, and in another six weeks we had another one hundred cases against the oleomargarine dealers. One hundred men have been indicted. These cases are still good. One man indicted in April, just before the expiration of the law was brought to the bar; he plead guilty and was charged \$100 and costs. As rapidly as the District Attorney will make way these cases will be tried. Then this new law came. Meanwhile the matter was taking money and for a time the detective force was laid off, but as soon as we could we again started prosecutions. We have prosecuted retail dealers for selling oleomargarine without having it marked according to this new law.

Our men are going around the hotels and cafés, and we are arresting men every week for using oleomargarine without not having the signs displayed as required under the new law. These cases are also good under the United States law which requires that every dealer shall pay a tax for the sale of oleomargarine.

Our Association proposes to enforce the laws as they are found on the statute books, and we have no intention of antagonizing the State Department of Agriculture. One of the hardest things in the world to do is to enforce the oleomargarine law, and if I were to tell you of all the bribes and political influence brought to bear to deter us, it would make every individual's hair stand on end.

Now, dairymen, you have the greatest interest in the State of Pennsylvania, and if you rest in peace and let the enemy destroy your market, you ought to suffer. If you are wise men you will help your State Department in organized effort to support the law, and you will drive dealers in bogus butter out of the market and will have a market for yourselves that will be a profitable and honest one. Let me say frankly that Major Wells has done what he could with the limitations. This Association which I represent stands ready to do what he possibly may not be able to do. We propose to stand back and see that the law is enforced.

Mr. Cutshall: I come from the north-western part of the State, and have something to do with the enforcement of the law in reference to the sale of oleomargarine, as I represent the Department, and I am glad to tell you that in every effort to enforce the law the oleomargarine dealer has come to grief, with two exceptions. These two cases are now pending in court, and I predict that both offenders will pay their fines and escape trial.

One of the thoughts in Major Wells' address is very pertinent; that is, if the Dairy Union can educate the farmers of the State that it lies with them to do a great deal toward enforcing the laws, or rather toward the lack of demand for a bogus article of butter, generally instructing the dairymen to make a better article, they will have done a great work. In talking to a meeting like this of intelligent men and women doing good work in their line, men and women who do not need scolding, it is a good deal like a minister of the Gospel scolding the saints when the sinners are absent.

We have got to get at the careless dairymen and interest them in knowing what is for their best interests. They are not here to-day, but there are many here who can go back to their homes and farms and counties and interest those who are uninterested; tell them what the law is doing for their benefit, and what they can do to help themselves. I have seen men traveling about my section of the State gathering up the objectionable article of butter, shipping it to New

York to be converted into renovated butter. If the poor article had never been produced there would have been nobody around to gather it up. When as dairymen we learn that every pound of butter not palatable or desirable injures the sale of good butter, and creates a demand for oleomargarine, we will have made good headway in our work.

In the section of country of which I am supervisor is the city of New Castle, where there is a great demand for oleomargarine. You cannot buy a pound of butter for less than 30 cents; which is a good deal of money to pay for a pound of butter. This creates a demand for a cheaper grade of butter and 23 persons have taken out licenses to sell oleomargarine. The dealers are compelled to comply with the law in stamping the goods and displaying the signs. Complaint comes to me that legislation is in favor of the dairymen, obliging people to pay a high price for butter. We need to do our best in this Dairy Union to bring about the remedy. The Dairy Union should not only hold up the hands of the Department of Agriculture, but should interest themselves in the dairymen of the rural districts who are careless about the manufacture of good butter.

Mr. Hutchison: I have received inquiries as to whether the agents of the Department are watchful throughout the State. I am advised from Pittsburg that out of 14 dealers only one was selling oleomargarine not marked. The balance had the goods stamped according to law, except on the color clause. In two weeks work of two men, there were found 19 parties who had taken out licenses who were not selling according to law. Cases will be made out against these. The balance of the dealers were complying with the law, displaying the signs marked "oleomargarine," and selling it for what it was. The cases will be tried as fast as we can get the courts to take them up. We ask you to uphold the hands of the Department of Agriculture, and you will find that everything will be done for the dairyman and the enforcement of this law.

Professor Hamilton: It is not necessary to state that we are much interested in this general question of the matter of pure food for the people of this State. I think the Pure Food Department of the Department of Agriculture has done more for the health of the people of Pennsylvania than perhaps all the physicians in it. It is doing a great deal toward making the goods palatable and wholesome. The question of good butter interests us all. Any man raised out upon the farm knows what good butter is, and good bread and good butter are two things to which most people are entitled if they are willing to pay for it. These dealers have come in with a substitute for butter, which, when first examined, was found to be unwholesome. The Legislature passed a law

that it was an unwholesome article of food, and prohibited its sale. It is not necessary for me to speak of this law, for you all know its particulars. The Department of Agriculture made a sincere effort to enforce this law. In Pittsburg a few months ago, before the new law went into effect, we had some 40 cases brought before the grand jury. The evidence was just as conclusive and clear as any evidence could be, and the grand jury ignored the bill. An appeal was made to the judge and presented to the grand jury again, and again the bill was ignored. That is the end of legislation, when public sentiment is in favor of the violators of the law. The Department went just as far as they could go but the bill was turned down. I think the friends of good butter saw that we could not go further in that direction. Some change of law was necessary and the Department of Agriculture said that it preferred that those directly interested should form this new law. The matter went into the hands of the Dairy Union and the present law upon the statute books was framed and presented and urged by them, and the business of the Department of Agriculture is to enforce that law. The first question that arose was the question of the constitutionality, particularly of what is known as the "color clause." One man in Philadelphia and one in Pittsburg have been arrested, and the point to be brought out is the color clause. We thought there was no use in bringing a hundred cases until the constitutionality was tested, and so the matter is just there—trying to get it before the court. As soon as the question is determined, the law will be enforced in all its particulars. There was just a little intimation that there were difficulties surrounding the officers of the law; that they were not exactly at liberty to do the things that are to be done. As for myself, there has been no approach in any way to try to hinder the enforcement of the law, and if there has been any such hindrance I do not know of it.

Mr. Kauffman: I take it for granted that the State Department wants to enforce the law. I fear, however, that it has an idea that it must wait until the constitutionality of this point is decided, although the other part may be absolutely constitutional and may be enforced. The only criticism I have upon the State Department is, that with the means at hand they ought to have made the utmost efforts to arrest every man for violation of the law. Give us the funds that the State Department has in the city of Philadelphia and we will arrest fifty men a day there who are selling unmarked packages, without having paid taxes and without having put up signs. With the force of men we have we cannot cover the territory. Oleo-margarine is sold by the cart loads in Philadelphia to-day. Gentlemen, who produce pure butter, what are you going to do about it? Why ought not the State Department put a sufficient force of men

at work to arrest every man selling oleomargarine contrary to law, irrespective of the color clause. Can we not all work together to do that. Is there not enough power in the State Department to stop it? We will help. Why wait for the courts. The gentleman from Pittsburg has spoken of the bill being ignored. I never had a case ignored by a grand jury, but have uniformly found the courts to stand by me. I am sorry that is not so in other sections of the State. If the State Department wants information, I can give them lots of it. I have a list of 50 or 60 dealers in oleomargarine who have not paid any tax to the United States Government. I recently learned of a case in the Terminal Market in which a man on Friday bought oleomargarine and on Saturday sold it as pure creamery butter, putting it up as creamery butter in prints.

We have to make up our minds that oleomargarine is here to make people obey the law. I ask in the name of the creamerymen of Eastern Pennsylvania that the State Department shall use enough money to employ all the detectives necessary to fine every illegal seller of oleomargarine in the city of Philadelphia.

Mr. Thomas Sharpless: I think it is due to the Department to state that there is a very strong feeling among the creamerymen that the Department is not doing its duty toward the enforcement of the oleomargarine law.

Major Wells: We have been doing precisely what Mr. Kauffman and the other gentlemen say we should do. Possibly we have not made as much noise. We have any amount of prosecutions pending in the city of Philadelphia. I can certify to the truthfulness of Mr. Kauffman's statements in regard to the grand jury. As I understand Mr. Kauffman, he has had one conviction; we have had hundreds of them. Philadelphia is a very important portion of the State of Pennsylvania, but it is not the whole of the State. We have as many agents in the city of Philadelphia as we can put there, and I believe they are active and doing good work. If we had the dockets here we could say how many cases. I cannot tell from memory.

Mr. Hutchison: I admit the good work that Mr. Kauffman is doing and wish him Godspeed. I would like to ask how many cases he has terminated out of the number brought.

Mr. Kauffman: The suits under the State law are criminal suits, the process of which is under the new law, but we have the arrests made under the magistrates. They have not reached the jury trial yet.

Mr. Hutchison: We have done the same, and we cannot force the courts faster than you.

Mr. Kauffman: In the United States courts we did not get our indictments in until April; the summer vacation coming on we didn't

have any trials. When the fall came I tried to have two or three of the old cases come up every week. We have 150 violations before the United States Court.

Mr. Hutchison: That is the same condition that meets the Department. There is the same trouble in trying the cases. I hope that this body will not pass judgment on the Dairy and Food Department of Agriculture until you have seen a test of this law. The law was passed in good faith and the Governor signed it willingly. Now give it a fair test before you condemn it. I hope the courts will sustain the color clause, in which case we shall have an almost prohibitory law; but, if it is stricken out we will still have a law.

It is hard to get convictions before any court. People claim that oleomargarine is a legitimate article of food. The sympathies of the people are with it. With all these conditions to meet I hope the Association will stand by the Department and give them a fair chance. The Department will do its duty.

Mr. Cutshall: I recently had an elaborate letter to the effect that a certain party in Erie under the name of the Erie Dairy Company was selling oleomargarine. The writer of the letter said he could furnish testimony to show that this was true. I replied that the statements were undoubtedly true, that the parties referred to had on the last of July been arrested, but he paid his one hundred dollars, and had since taken out a license, and was in every way complying with the law. This is a case in which it was thought oleomargarine was being sold in violation of the law, and just such cases prove that the law is being enforced, where it was thought to be violated. The very fact that you cannot buy a good article of butter in Philadelphia for less than 30 cents, and in good farming country for less than 25 to 30 cents, shows that there must be something done in enforcing the law or else there will be more oleomargarine sold.

Mr. Thomas Sharpless: I would like to ask Major Wells whether under the old law he made any convictions in Philadelphia?

Major Wells: Certainly; there were hundreds of dollars paid.

Mr. Sharpless: How about J. Otis Paul?

Major Wells: He paid the fine.

Mr. Hutchison: There were a number sent to jail; one from Lycoming county. In Lackawanna county the grand jury ignored the bill, although we had a well prepared case. We have all these difficulties to meet.

CORPORATION OF CREAMERIES.

BY F. L. McSPARRAN.

The programme of this convention gave me notice that I was to have a paper on "Creamery Corporation" for this occasion.

I think a better name for the ideas I shall advance in my crude way for your consideration would be "Creamery Organization." Let none be alarmed. I do not mean a trust.

I am unalterably opposed to trusts. A trust, as I understand the present day significance of the word, means a combination of men, interests, capital and water to so restrict and manipulate the manufacture of an article of commerce as to shut out competition and realize abnormal profits. I am glad to say, however, in passing, that the dreams of promoters of these trusts are not always materialized.

Now, if my definition of the trust scheme be, in the general application of it, correct, any one at all familiar with the management of a creamery in eastern Pennsylvania must know that a trust is impossible, inasmuch as it is fundamental to our creamery history that we have constantly endeavored to pay the farmer the most possible for our raw and very often dirty raw material, while we have fought our brother creamerymen, tooth and nail, for the markets and customers that would give us the best returns.

What measure of success has met our efforts in our markets has not been absorbed for the enrichment or betterment of ourselves, but has been passed on untithed to the dairymen with the faint hope in our hearts that we might in some small degree satisfy his eternal cry for more pay for his milk. No one ever heard of a trust doing any such thing as that. We, therefore, get rid of the trust imputation in this discussion.

But by a wise and carefully managed organization, I am firmly of the opinion that we can by the one move improve our fortunes as creamerymen (a thing much to be desired), place a much more uniform grade of better butter on the market, thereby commanding the best trade and prices and pay the painstaking dairyman more for his milk. I am merely giving voice publicly to problems that have been frequently discussed by members of our creamery association, where we have all been familiar with the evils that beset us and our business, but have never taken any steps to combat or remove them.

Many of you know perhaps, that there are certain conditions and circumstances surrounding and controlling us creamerymen in south-eastern Pennsylvania. It is true we have many advantages that those more remote from the markets do not have, but excepting distance, we have, I believe, all the disadvantages they have, and many more too.

Our first difficulty is with the raw material, or milk, as to quality and condition when delivered at the creamery. Trying to make good butter from bad milk is like making bricks without straw. Our second trouble is in securing competent and trustworthy workmen. Third, the cost of manufacture. Fourth, the cost of disposing of the finished product, and fifth, unfair competition in buying the milk and disposing of the output.

I can scarcely hope to off-hand give a prescription that will cure all the organic and deep-seated troubles, but I should expect a marked reduction, and in some instances, a total abolition of some of them, if we should so combine our efforts, and pool our interests to the extent of an organization of creamerymen with sufficient capital to erect and equip a central up-to-date plant for converting milk into the various products known to the trade, and marketing the same to the very best advantage.

Place at the head of the concern a competent man and let him in conjunction with a board of directors, run the affairs of the company. Employ one or two first class butter makers, and get rid of many ordinary ones that we now have to pay.

Employ a good chemist for testing the milk and experimenting on the by-products, an inspector to be on the road all the time inspecting herds, barns, care of milk and separating stations, giving the farmer information on the proper way of feeding and handling cows and milk, and let every thing at every point be done to make the product, be it butter, cheese, condensed milk, cream or ice cream, of such quality and attractiveness that dealers and consumers could always depend on it. Let the salesmen and collectors be the best in their lines. There are numerous other matters of detail not necessary for me to enlarge upon at this time.

Such an organization as I have briefly outlined, properly managed and safe-guarded, would command countless tons of the best milk at all times. Could manufacture it into superior products to the best advantage and at greatly reduced cost. Then these three aims would be attained. The creamerymen would make more money and have less worry; the farmer could be paid more money, and by being taught the best methods of cows and milk would produce more at less cost to himself, and the consumer would have better goods at no increase of cost. It appears to me this plan is worth entertaining from the standpoint of philanthropy alone,

MODERN METHODS OF DAIRY PRACTICE.

BY PROF. EDWARD B. VOORHEES, *New Brunswick, N. J.*

"In time of peace, prepare for war," is an adage that appeals to, and is observed by prudent governments. In time of agricultural depression, prepare for expansion, is another adage that possesses force, and I am sure that those farmers who in the past few years have made it a point to study their business, to practice economy, and thus to reduce the cost of their products, are now beginning to reap the fruits of their labors. They have better animals, they feed them better, and they are making a larger and better product.

There is, however, improvement all along the line in the demand for dairy products; prices of milk and butter are much higher, and there is a greater appreciation of high quality. These greater, and to a certain extent different demands, cannot be met by antiquated methods of practice.

In the specific demands of modern times, lines of business which are successful, are managed according to modern methods, for while the use of others may not always result in a loss, they do not result in the most profitable returns, particularly in a business where the necessity for the use of progressive methods are so great as in that of dairying. In the first place, I think we do not appreciate as we should, that dairying is really a manufacturing business; in its processes the raw materials made are taken and converted into products of a higher value; it is moreover a complicated business, because it involves both the production and change of the raw materials, and because in the processes of production and change, natural, rather than mechanical laws, have to be observed. It is, therefore, not possible to control with such precision the relations existing between the raw materials and the finished product, as would be the case if mechanical laws alone were involved. Furthermore, while the production of the raw material is also in a sense a sort of manufacturing, it requires a higher degree of intelligence and business capacity to change the raw materials into a manufactured product than it does to prepare them. The machines involved in the process of change are animate, and subject to the laws of life, not dead, thereby subject to mechanical laws, only. This difference between lines of business is illustrated very nicely by an example from a purely mechanical business, as, for instance, the manufacture of iron, where the divi-

sions of the various processes involved in the production of the raw material and of finished product are clear and distinct. The production of the raw material, bears no distinct relation to the manufactured product, and it is seldom that in the business of producing the finished iron product, that the manufacture is at all interested as to how the raw material is prepared, so long as it is in a form or shape to suit his particular kind of manufacture, or in other words, the mining and the various processes required in the preparation of the material previous to his use of it constitute a separate and distinct business. In the case of dairying, the principles and processes involved, both in the production of the raw material, and its conversion into the finished product cannot be clearly separated.

The manufacturer of dairy products must understand the laws that govern the bringing together of the constituent elements of air and soil, into the raw materials, as well as with those that govern and control their economical change into other products of a higher value. Besides, in this manufacture of dairy products, the more highly finished the product is, the greater the value of the wastes of manufacture, which contribute so largely again to the economical production of the raw material. In this manufacturing business therefore, a broader knowledge and a higher degree of intelligence are required, than in the manufacture of products in which mechanical processes are largely involved.

With these statements in reference to the manufacturing side of the dairy business, it may be well to state that its progress just as truly as in any other line, depends upon two very important principles or objects, first, a reduction in the cost of the finished product; and second, an improvement in its character, or quality. This applies to all lines, milk, whether sold at retail or wholesale, butter, whether made at home or at the creamery, and cheese, whether for home or foreign consumption. Most farmers are willing to admit the proposition in reference to the cost of production, but they do not see the force of it in reference to improving the quality of the product, particularly if it goes into the general market. They have not yet acquired that business acuteness which enables them to appreciate the influence of poor products in reducing the market price of both the poor and the good, as well as in decreasing the consumption, and thus the demand for them.

1. TO REDUCE THE COST OF PRODUCTION.

It is very evident, in order that this very desirable object may be attained, that the dairyman manufacturer, must have a knowledge of all of the conditions, that are involved. Take the case of the manufacturer of iron, for example, he makes himself familiar not only with

the character and properties of his raw material, but with the various processes through which it must pass, in order to obtain the finished product. This involves a knowledge of the power or energy used, how it is obtained, the machines required throughout and their usefulness; the lines in which the finished product may find its best use, and of other things that may be connected with his particular branch. So in the case of the dairyman, he must be familiar, not only with the raw material itself, but with the processes involved in its production, the machines through which the material must pass toward the finished product, and the conditions which influence rate of consumption and price received. In the case of the dairyman, one of the most important conditions involved is the machine, or the cow, both in reference to the quantity and the character of the product that may be obtained from her.

As already stated, this machine differs from the machine of the manufacture of iron, in that it is a living, sentient thing, possessing in a sense, character, which modifies and controls, not only the mere utilization of the raw product, but which exerts such an influence, as to materially change the character and composition of the finished product. In other words, cows are not inanimate dead machines, controlled by mechanical laws, and, therefore, a certain definite amount of raw material put in, does not necessarily come out of one machine of the same kind, exactly in the same finished product, as from another. In the case of the purely mechanical machine, it is only necessary that the feeder shall put in the raw material, the product is always the same kind, only the quantity made, will be influenced by the operator.

In order that the cow machine may utilize to the best advantage the raw material, knowledge concerning the characteristics of various animals must be understood. Their form and structure, digestive capacity, age, etc., and also the relation that exists between the amount of raw material necessary to maintain the machine in proper working order, and that over and above this, which may be converted into the finished product. This difference in cow machines has been shown by the investigations of our various Experiment Stations, and in a most practical and striking way. In our herd, for example, there are two cows, standing side by side, which consume practically the same money value, of raw materials annually, yet the quantity, kind and value of their products differ radically. On the milk basis of comparison, one animal fed in round numbers \$40.00 worth of food, produced 12,000 pounds of milk in a year, the other consuming \$40.00 worth of food, produced 4,500 pounds of milk in the same period, though the raw material was the same in each case, and its use was

under the direction of the same person. At \$1.00 per hundred, the gross value of the product of the one is \$120, and that of the other \$45.00. Or, in one case, a gross return over the cost of feed of \$80, and in the other of \$5.00. They are both cows, both in a sense machines, and the reason for this great difference, in the value of their finished product, is not due to the fact, that it requires a great deal more of the raw material, in the one case to maintain the cow machine in a uniform condition, than in the other, both are of the same weight, and both machines need about the same amount of fuel to keep them in working order, but in the one case, with this fuel supplied, the raw material over and above that was converted into a larger amount of product, because of better construction, and thus better digestion and assimilative capacity. The two animals differ in their milk capacity to take the raw material, and to convert it into milk. Two machines that depend for their usefulness upon mechanical laws only would produce results identical, if under the same direction, because of the absence of this mysterious thing called "life," which in this manufacturing business is constantly interfering to change results.

Modern methods of practice require that the manufacturer of milk, in order that the cost may be reduced, shall thoroughly understand that the machines with which he is to work are animate things and must be understood in reference to their capacity to utilize and change the raw into manufactured products. The progressive dairyman should select only those that possess maximum capacity. On the milk basis, these two machines differ widely, sufficient in itself to warrant careful study, for there was a gross profit in one case of \$80, and in the other of but \$5.00. This is a matter of supreme importance in these modern times, when the cost of production is an important factor in successful practice. There is another consideration here, however, which must not be lost sight of, and that is, that the product of these two animals, or machines, differed materially in their character, notwithstanding the fact that the feeds, or raw materials, used were practically identical. The one machine converted it into a large quantity of milk, which contained on the average 4 per cent. of fat, while the other converted it into a smaller quantity of milk which contained 6.5 per cent. of fat. On the basis, therefore, of butter as the manufactured product, there is not such a marked difference between the two machines. At 25 cents per pound, the \$40.00 worth of raw material was converted into butter worth \$140.00, or a gross profit of \$100, whereas in the case of the other, the \$40.00 worth of raw material was converted into butter worth \$85.00, with a gross profit of \$45.00. That is, while the machines differed materially in the amount of the product milk, they still differed in

respect to the product butter, though not in so great a degree; as butter makers, both machines may be regarded as profitable, though the one returns over two dollars to one for the other. Knowledge of conditions which shall lead to the adoption of the better machine, is very important in reducing the cost of the manufactured product. In other words, modern methods of practice demand that a knowledge of the cow as a producer of products of different kinds, shall be thoroughly understood, and that such measures shall be adopted as shall enable the manufacturing dairyman to obtain the greatest value of product from a definite amount of raw material.

The next important consideration is, the production of the raw material, though in the time at my disposal, I shall not be able to develop this point, but shall pass to the other conditions which, in my judgment, need strong emphasis. Of these, the feeding of the animal (the fuel for the machine), and the kind and proportion of the compounds in the raw material capable of conversion into the manufactured product is next in order. In this case, too, the business is far more complicated than lines of manufacture, in which a single definite product constitutes the raw material, because all foods possess not one, but three groups of substances, and the amount of these, while important, is no more important from the standpoint of economical production of milk, than the proportion in which they exist; many natural products harvested and fed in the usual way are better for fuel than as material for the manufacturing of milk. That is, in the rations for dairy cows, the raw material must contain these compounds in certain definite relations or proportions, in order that the animals may utilize in the best manner the various nutrients. This, of course, is simply another method of stating, that animals shall be fed balanced rations, which is nowadays clearly understood by many dairymen, yet I have to say that this matter is in part a business matter, and that balanced rations are best, only when they supply the raw material necessary at a lower cost in relation to product made, than those which are unbalanced. This, again, is dependent both upon the cost of production of foods, which may be grown upon the farm, and the cost relative to this, of the materials necessary to purchase, in order that the rations may be properly balanced. That is, while the nutrients in the balanced ration may be more fully utilized than those in the unbalanced ration, conditions of production, or of purchase of food, may be such, as to make the cost of the product from the unbalanced ration, less, than from the balanced ration.

I do not desire to be understood as recommending the use of unbalanced rations simply because the food constituting them can be raised upon the farm, but rather as urging a right study of the cost

of the finished product; if the cost can be reduced, by a larger use of home-grown products, which widen the ration, then it's business to do so; do not for the sake of using a balanced ration increase the cost of the product, and do not use an unbalanced one when the cost of production is not decreased thereby. This has been illustrated very nicely by experiments at our own institution, where it was shown that the cost per quart of milk was quite as low, when an unbalanced ration was used as when a balanced ration was used, though in the case of the balanced ration the production was so largely increased as to make it a desirable thing to use the former. In this particular case, the conditions were too strongly contrasted, that is, in the case of the poor ration, the nutritive ratio was entirely too wide, much wider than necessary, even with the sole use of homegrown produce, but it illustrates the point. It has been demonstrated to our satisfaction, that in these particular times, when the prices of concentrated feeds rich in protein, the substance necessary to purchase in order to properly balance our homegrown products, are relatively high, that it is more profitable, and more in accordance with business methods, to use a ration that is unbalanced in the sense that its nutritive ratio is wider than 1:5.4. For example, a ration made up of sufficient amounts of silage, corn stalks, corn meal, dried brewers' grains and cotton seed meal, and which shows a nutritive ratio of 1:7, is more profitable under present conditions of feed prices, than one made up of silage, corn stalks, wheat bran, dried brewers' grains and cotton seed meal, showing a nutritive ration of 1:5.4, the standard for dairy cows in full flow of milk. This is not because the food materials in the one are utilized as well as in the other, perhaps, but because the yield of milk is the same with one as with the other, and because the cost of the food products are such, as to make it more profitable to waste a small portion of the cheaper home-grown carbohydrates, than to prevent waste by the purchase of more, in connection with the more expensive protein of concentrated feeds. This, of course, is on the basis of food values only, the manurial values are not taken into consideration.

In the next place, conditions which influence a reduction in the cost of the milk or butter product are dependent upon the kind of raw products used, and the amounts and proportion of the various nutrients in them, and also upon the character of the roughage used, which supplies part of the food, whether it possesses succulence and palatability, or whether palatability only. In my judgment this point cannot be emphasized too strongly, it is a condition which in a proportionate degree, at any rate, measures the profits, particularly when winter dairying is practiced, and when the ordinary coarse products are in a dry state. A full flow of milk at this season is only

kept up (the capacity of the machine is not fully attained) except when the conditions of feeding approach as nearly as possible those obtaining in summer. It has been shown by repeated experiments, that the cow differs from the machine, in that its fuel must possess in addition to actual heat units, different proportions of food compounds, and that they shall exist in substance which are similar in character to those existing in nature in the growing season. I have particular reference here to corn, the cheapest and best of all our forage crops. The same total amount of original nutrients in corn in the form of silage will produce more milk than in the form of dried fodder, ranging from 10 to as high as 18 per cent., while the cost in one case need be no greater than in the other. This is a fact which should appeal strongly to the businessman. The question as to the relative cost of the dry matter in silage, as to the losses that are to be expected, and the usefulness of it, have been settled from the practical standpoint. The practical progressive farmer will make no mistake in adopting the conclusions that have been reached. It is, however, not altogether a question of silage as silage, but partly a question of the influence of succulent material in maintaining the milk flow. This may be accomplished by the use of such crops as sugar beets, mangels, etc., and these may be substituted when their use will be more economical; this is a question which the conditions of the individual must help to decide. All must admit, that if an acre of corn as silage rather than fodder corn will produce milk worth \$10.00 more, at \$1.00 per hundred, than if used in the dry state, modern and progressive methods of practice demand that the silo shall be adopted.

A brief review of these considerations leads us to conclude that dairying is eminently a business which requires that all the conditions which influence and control this cost of production shall be understood. It is not enough to simply know what kind of crops to grow, it is not enough to simply know how to grow them, it is not enough to simply know how to select a cow, it is not enough to know how to feed her. One may know how to control one or two, or even more of these essentials, and put his knowledge into practice, and yet not be successful, because one of the essentials is lacking. The various factors of success are inter-dependent.

In the second place, modern methods of dairy practice require that the dairyman shall study the conditions which encourage a larger use of his products and at a higher price. Too many dairymen are satisfied to make their product, without exercising any thought or care concerning its future, and without realizing the influence that they may have as a body in developing a greater demand for them. The business principle should enter here, too, as well as in the

matter of production, and the dairyman should avail himself of such means as lie in his power, to encourage a larger consumption of whole milk, and of all the various products of the dairy. In these days, of thought, concerning the things we eat, there is a great opportunity for the dairyman; he has it within his power to control the cost of production, and to some extent in certain lines, to fix the price that he shall receive for his product. The consumer to-day is beginning to think about what he eats, and to investigate the various materials that supply his table, and it is the business of the dairyman to develop and encourage this spirit; he should place before the consumer a product which is the best of its kind, from the food standpoint, and which possesses uniformity and high quality, in respect to composition. The consumers of milk, particularly, need education—it has been sadly neglected, many of the people in our towns and cities do not know what good milk is, they believe that variations in composition and quality must necessarily accompany it. They expect it to be rich one day, another day poor, one day sweet, and on another that it shall possess distinct flavors, not altogether desirable, and thus they use as little as possible; they certainly are not encouraged to use so large a quantity as they would, provided it was uniformly rich and of high quality. The same is true of butter, high quality always encourages a larger use at a higher price, and it stands to reason that if the producers of these various dairy products were satisfied of the practicability of educating the people in this respect, they would at least make an effort, rather than to feel that their responsibility ceased as soon as it was passed on to the manufacturer or dealer, at any price he is willing to pay. It may be said by some, that these principles apply only to those who have a retail trade, but this is not so. The influence is general in its character, and in its reflex action touches those who sell to the dealer, and butter or cheese maker, as well as the retailer, though perhaps in a less degree. I believe that there is no line which promises more in the development of the dairy business than the application of business principles, i. e., modern methods in the handling and sale of milk. To illustrate this matter, I am fortunately able to report the results of actual experience, the facts of which strongly support this contention.

It was possible in 1896 for the New Jersey Experiment Station to inaugurate a series of practical experiments, designed to demonstrate whether or not improvements along this line would result in an increased sale, due to a larger consumption, and also whether consumers were willing to pay a higher price for a product, better than the average. The conditions of the experiment in the beginning were, a herd consisting of ordinary grade cows, kept in an or-

dinary barn and handled in the ordinary way that dairy animals are handled, in dairies supplying the retail market. No particular attention was paid to the feeding of the animals, to the cleaning of the barns or cows, or to the care or preparation of the milk for market. The milk sold, was very much like that which is sold by most dealers, now rich part of the time, and poor part of the time; sweet one day and sour the next; one day free from distinguishing flavors, another day tainted with garlic or decayed vegetable matter, which all must admit do not contribute to a large consumption. It was not possible to make the desired changes at once, as it was necessary that all the improvements should be paid for out of the income, no special appropriation was provided, and the improvements consisted mainly in applying the principles of cleanliness to every part of the work from the feeding of the cow to the delivery of the milk. The first improvement was to provide the animals with good, wholesome food, the second, that they should be kept in clean barns, well ventilated, and third, that both animals and barns should be thoroughly cleaned every day. In respect to the handling of the milk, such methods were adopted as would make the milk uniform in composition from day to day, prevent the introduction of bad odors and flavors into it, during the cooling, and as far as possible, prevent any changes in it before or in a reasonable time after it was delivered to the consumer. It was possible during the first year to make improvements only in the feeding and cleaning of the animals, modern methods of handling the milk could not be introduced until the second year; it was still cooled in a shed near the barn, which was frequently hot and often dusty. The milk was sold on its merits in a town of 20,000 inhabitants, no attempts were made to increase sales by advertising or other solicitation, and the result was that at the end of the first year the sales had not increased five per cent. over and above those of the preceding years. That is, just as in the case of reducing the cost of production, the object was not gained, because all of the conditions of cleanliness were not observed. The lack of one thing, proper handling of the milk, prevented the advantage that should have been gained in better feeding and cleaning of animals.

In the beginning of the second year, a modern dairy-house was constructed at a distance from the barn, where the air was pure and cool, and where it was possible to thoroughly sterilize and cleanse the entire interior of the building, as well as all utensils, and to keep the milk after it was drawn from the cow and cooled at a temperature that did not favor the growth of bacteria, which cause souring and disagreeable flavors, until delivered to the consumer. During this year, the milk continued to be sold upon its merits, and during

the first six months after all these conditions of cleanliness prevailed, the sales increased 30 per cent., and in the corresponding six months of the next year they increased a further 20 per cent., and during the third year, another increase was made, though during the third year all customers that did not pay promptly, and those who took but small quantities, were cut off. In fact with the fourth year, as late as October, 1899, the sales were 1,086 quarts in excess of the sales for the corresponding month in 1898, or a further gain of about 15 per cent. Furthermore, this was not a paper business, cash was received for every quart of milk sold, and it was sold at a higher price on the average than the milk of other dealers in the city, in fact, the milk of ordinary quality was so abundant then that it was offered as low as 4 cents per quart, when these sales under the experiment were steadily increasing at 8 cents per quart. In other words, as soon as it was possible to introduce methods which guaranteed uniformity, richness and purity, the sales increased immediately, the customers are more than satisfied, and the business is now highly profitable. The customers know that they can depend upon the quality of the milk, that it is the same from day to day, that it is always clean and always rich.

A careful study of the cause of these increased sales develops the important fact that it was not due altogether to new customers, but to a larger consumption by old customers, and as near as we are able to calculate, this increase amounted to at least 15 per cent., thus it was definitely proved that the rate of consumption is increased, when a better quality of product is furnished, and that it may be sold at an advance of about 33 per cent. above the price of the average product. It would be futile for me to attempt to demonstrate what the effect would be upon the dairy business of the country, if the consumption of whole milk was increased 15 per cent. in all of the large cities of our country, and at this higher price, yet I am satisfied that this could be accomplished if the dairymen fully appreciated his individual responsibility. This experiment is not the only example that I could cite to show the importance on the part of the dairyman of a knowledge of the conditions which influence consumption, and of the value of the adoption of modern methods of handling milk in increasing the profits of the business. We have in our State several dairies of this character, that are highly profitable, because these principles have been adopted, and they are not all confined to those who retail their products; the principles reach out and touch all dairymen, whether they supply the city markets directly or through dealers. A number of farmers to my certain knowledge are receiving from city dealers 5 cents per quart, at wholesale, when their neighbors are receiving but 3 cents per quart. They are putting

modern ideas into practice, and the city dealer knows that he can depend upon the product of these men, and that he can sell it at a higher price. These business principles apply all along the line; grand opportunities are now afforded for the development of the dairy business along business lines, they should not be overlooked. Let it be said that American dairymen live up to their opportunities.

DISCUSSION.

Professor Armsby: The experiment which Professor Voorhees reports, is one of the most carefully conducted, under normal conditions for the dairy cow. I must say that his result is opposed to the results of a good many other experiments which it is not necessary to quote here, so that I think we must in fairness admit that we don't know all about this matter yet; that there are some conditions in the matter of feeding not yet taken note of. There are experiments on record which fail to show such advantage as Professor Voorhees reports. The difficulties we have met in reaching final conclusions simply means that we have not got at the whole truth yet. It is perhaps a good state of affairs in that it will set us all to work.

Professor Hayward: It may be that the difference in results can be explained by the fact that some cows have gotten started along certain lines of feeding, and the result would be the same no matter what change was made in the food.

Prof. Hamilton: Do not the experiments made by Professor Jordan throw some doubt on the fact as we know what a balanced ration is. Some of the statements he has made are inexplicable on the ground that the cow has a balanced ration.

Mr. Smith: All the work we do shows when we widen out the ration and reduce the amount of proteids that the quantity of milk goes down while we do not change the quality. We changed the flow of milk very rapidly when we changed the ration. We had the same experience last year in the feeding of our cows that Professor Voorhees did.

Professor Voorhees: With people who are located at certain points where it is impossible to get nitrogenous food and cannot raise it, it is a question whether or not they can afford to pay a high price to get the milk. When we widen the ration the milk flow goes down. In some cases the milk that we did get cost us less per quart than when we used the narrow ration. The main thing we should study is the question of raising proteids on the farm, so that we can have the balance ration the year around. When bran goes up 50 per cent. it is a question whether we are going to make more by it from the standpoint of leaving out the constituents. Those

men who develop cows that give such enormous quantities of milk are the shrewdest men we have in the country.

Mr. Cavanaugh: I think the cow herself will be the judge of the food she takes and of what she can do after she takes it. You cannot change the result in the cow by any kind of food you give her. The cow that gives rich milk will give it on poor food if she gets enough. A cow that will give thin milk will do it on the highest feeding you can give her. This is a fact which I think every observing dairyman is aware of.

Mr. Sharpless: I would like to ask Professor Voorhees what plant food we could probably raise here that will furnish us proteids.

Professor Voorhees: Oats and peas, I think. I think if proper care is taken, alfalfa and more of the albuminous plants like peas, beans and cow peas.

Mr. Sharpless: A number of experiments have been made in Chester county recently of raising peas and oats, and as far as I know there has not been much success in that direction. These plants, especially peas do better in cooler climates.

Mr. H. W. Comfort: Every year Mr. Branson grows a large field of oats and peas.

Mr. Frazier Smith: A great many of our farmers where they have not succeeded with oats have later put in barley and have had great success with it.

DAIRY EDUCATION.

BY DR. H. P. ARMSBY, *State College, Pa.*

I have just a few words to say upon this topic of the education of the dairyman which has been more or less in our minds throughout the sessions of this convention. It seemed to me that it would be unfortunate to adjourn without giving a more definite consideration to this topic which has been implied in so much that has been said.

It is now something like 38 years since the Congress of the United States in the very darkest period perhaps of our great Civil War passed an act which served to mark an era in the history of education in this country. This act was the Land Grant Act of 1862, introduced into the House of Representatives by Justin S. Morrill, of Vermont. Up to that time the general conception of education of this country, of the higher education at least, had been that of the old-fash-

ioned college. A liberal education was looked upon as preparing men for the so-called leading professions, the ministry, law and medicine. At that time there was scarcely an institution in this country which undertook to prepare men in any considerable degree for the other callings of life.

This law of 1862 provided for the establishment in every State of a college whose leading object should be instruction in agriculture and the mechanic arts, and the end of that instruction was said to be the liberal and practical education of the industrial classes.

That was a new departure at that time. The purpose of this act was to give to the working masses of this country the training and intelligence which it was becoming increasingly evident they needed. I remember very well a few years later than that when about finishing my high school course, the foundation of an institution of that character was laid in my immediate vicinity, not under the provisions of this particular act, but a school whose purposes were the same, a school of technology. I among others entered that institution and took a course in it and graduated in the course of chemistry. This work has gone on since then. These schools have multiplied and increased both under the direct provisions of the act of Congress of 1862 and through the indirect stimulus of the act. In 1868 and the early seventies, when the schools were increasing, and training men for engineers, chemists, architects and for the professions, I suppose it would almost have provoked ridicule to propose a school for the training of dairymen. It was coming to be recognized that a man need some training to conduct a machine shop well, to build bridges, roads or houses, but anybody could make butter. And I don't know but that feeling has survived to some extent to the present time.

In a sense it is true, anybody could make butter. The great difficulty was in many cases that after it was made there was nobody to eat it. It was a good many years before it came to be recognized that the men who produced the food supply of this country, and particularly the dairymen, saw any particular need of a special education for their business. So far as I know the State of Wisconsin was the first State officially to recognize this need, and about 1888 or 1889, I think, the University of Wisconsin offered to give instruction to the dairymen of that State in the principles and practice of the dairy. They put up a sort of temporary building to help the dairy interests of their State. They were overwhelmed with students, and from the beginning, the institution has gone on. Many of you know something of this history of that first and perhaps the most famous school for the practical dairyman.

Within two or three years the State provided them with a special

building for getting practical instruction. The building cost \$40,000, and was a most admirable one, provided with every convenience. The principles underlying the art of the dairy are the same as those applied to other arts; and we must not only learn the principles, but apply them, and largely learn the principles through the practice. That school the present year has, I think, 128 students, and Professor Henry writes me that they are thinking of confining it exclusively to students of Wisconsin. There is no room for others. The State has recently given them an appropriation of I think \$40,000 or more, so that by the end of the year they will have an equipment for this specific work of the manufacture of butter of something like \$70,000. The costs amount to something like seven thousand a year exclusive of the receipts from their products. A little later, the State of Wisconsin took up the same idea and built a dairy building costing about \$30,000. They had the same experience of a demand greater than they could supply, proving that the dairymen in those regions were awake to the necessity of their business. They have about doubled their capacity since that time. Their equipment is worth in the neighborhood of sixty or seventy thousand dollars, and their annual expenditures run up into the thousands for work of instruction and dairy. Other States have followed the example. Ohio has an equipment of \$100,000, a considerable part of which is devoted to the instruction of dairying. Iowa has an equipment of something like \$18,000. Our neighbors at Cornell have a beautiful building costing something like \$50,000. How much they are spending every year to educate their class of fifty dairymen, I do not know.

I mention these because they are perhaps some of the most prominent and striking examples of the advances which have been made within the last ten years in this matter of dairy instruction. Vermont also has a flourishing school; I do not know what their equipment is. Indiana and Michigan have equipments.

Now, the point that I am driving at is simply this. It seems to me that we as dairymen should be awake to the importance of this work, and to the importance of utilizing all our facilities for a dairy education, and that we ought to be thankful that at least the country is awake to the importance of this line of education.

Those of you who have heard Professor Voorhees and the admirable address of Professor Roberts, must have been impressed with the importance and dignity of farming and dairying in dealing with the mysterious and tremendous nature of the forces with which we have to do, with the necessity of knowing more about this interest. If the dairymen of Pennsylvania are going to maintain the position which they have in the past, it is an absolute necessity, in my judg-

ment, that they appreciate and understand the necessity for education along dairy lines. I am told, I do not know how true it is, that the commission merchants in our large eastern cities, Philadelphia and New York, are discriminating against Pennsylvania butter. I cannot vouch for the truth of this statement, but am told that is the case. If that is true, doesn't it necessarily mean that our butter is not as good as the Western butter? Doesn't it mean that we have got to wake up and keep up with these people out in Wisconsin and Illinois and Minnesota, who are learning how to utilize the latest discoveries of science and the mechanical appliances and make the best butter? Pennsylvania used to make the very best butter. The only way I know of for Pennsylvania, for any other State, to acquire a reputation for making good butter, cheese, or anything else, is to make it so good that there will be no question about it.

I believe one important step is in the direction of dairy education for the young men, so they will know how to make it and know why they do as they do. That is the whole point of what I have to say, to emphasize just as much as I can the importance of this matter to the dairymen of the State; the importance in dollars and cents, and to emphasize the great change which has come over the general situation in the last ten years. Ten years ago it was almost useless to talk to dairymen in this strain, because there was no place where they could acquire this education. Now, the situation is different.

We have an institution in a neighboring State and one in this State, but I have refrained from saying much about it, and am not here to advertise it. The problem before the dairymen of this State, as of every other State, is to learn how to conduct their business. Professor Roberts said he was going to have some circulars distributed, illustrating the most admirable work in Cornell. When he presents those I want to call attention to the fact that we have been doing a little of that sort of work in this State. We are not so fortunate as they in receiving \$35,000 from the State. They are doing a most admirable work there. I wanted you to know, however, that we are doing something of the same in our own State.

DISCUSSION.

Mr. S. F. Barber: I would like to ask how the dairy educational advantages of this State compare with that of others?

Professor Armsby: The last two Legislatures have each appropriated \$6,000 annually for all the expenses of the school of Agriculture, including the dairying and collegiate course. Our equipment at the college consists of one building costing about \$2,000. We have the use of the lecture room in another building which is not worth anything practically, as it was a shed run up for temporary purposes. Our equipment in dairy apparatus is worth perhaps

seven or eight hundred dollars. I think putting the entire plant at \$3,000 would be somewhat overestimating it rather than underestimating it; and the total amount available for the expenses of the dairy school, including salaries is probably \$900 a year. Since Mr. Barber has mentioned the subject, you will see the contrast between these figures and those given by other States. It seems to me that it is a question for the serious consideration of the dairymen of this State. This is not a matter to be considered in the interest of any institution or any man, but a question to be considered in the interest of the dairymen of the State of Pennsylvania. I want to make my position on that point perfectly clear. The Pennsylvania State College has no claim upon the State, except as the agent of the State for doing certain kinds of work. The question which it seems to me that the dairymen of this State and the Dairy Union ought to consider is the education of the dairymen throughout our State.

Mr. S. F. Barber: In view of what has been said in regard to the relation of education to dairy interests, it seems to me appropriate at this time for the Dairy Union to take some measures that will be of advantage in advancing its dairy interests, and I move that a committee of five be appointed to consider what would be feasible in this connection and report at our next annual meeting.

Mr. H. W. Comfort: It seems to me that the State stands third in the butter making and third in cheese, and that we ought to be doing something to aid our industry much more than we have been doing, or we will certainly be left very far in the rear of a great many other states of the Union.

Professor Hayward: I move that the present treasurer be chairman of the proposed committee.

The committee on resolutions was appointed as follows:

S. F. Barber, of Harrisburg.

J. K. Murray, Pottsgrove, Pa.

John I. Carter, of Chester county.

WASTES OF THE DAIRY.

BY R. A. PEARSON, *Assistant Chief of Dairy Division, United States Department of Agriculture.*

We are surprised when we read in the annual reports of the post-office Department that the receipts from sales of postage stamps amount to almost ninety millions of dollars each year. The little

pieces of gummed, colored paper are so cheap and insignificant that it seems impossible for them to make so great a total. The amount of money wasted in our dairies is comparable to this immense sum which our government receives for postage stamps—it is made up of 10, 5, 3, 2 and 1 cent, and even smaller items, each one by itself trivial, but altogether tremendous.

There are wastes in every business, and in these days of close competition, the career of a business man often depends upon his success in reducing and stopping them. An out-and-out loss, as the breaking of a dam, or the destruction of a building by fire, is not dreaded by the manufacturer as much as the small but continued disappearance of his profits through some leaks which he cannot stop. The brightest minds are studying the problem of reducing cost of production by the better utilization of wastes. At every step in the well organized industries, strenuous efforts are made to get the most from the least—the greatest of value from the least expenditure of time, labor and material. Any failure to do this may be called a waste.

The manager of the railroad works day and night in his efforts to reduce the cost of hauling freight, by even a small fraction of a cent per ton per mile. He lays a little better track, puts little larger loads in the cars, makes the trains a little longer—in fact makes improvements all along the line for the purpose of lowering the cost of carrying by an amount so small as to seem insignificant to most people.

The successful manufacturer is constantly on the alert for more economical methods. He is the great exception who needs to have his attention called more than once to a waste which can be avoided. The shoemaker who can reduce the cost of his soles one or two per cent., or five cents a pair, considers himself fortunate. The weaver who learns that a new machine will do his work with slightly less waste than the ones in use, makes plans to change his equipment. We have read recently that one of the principal reasons for Carnegie's great success is his practice of replacing the machinery in his mills with other which will do the work in a little better manner at a little lower cost, as fast as such machines are invented. He has always considered it a waste to do otherwise, and many a time the apparently good but really out-of-date machines have gone to the scrap heap because they were wasteful as compared with their successors, which were procured at great cost to replace them.

The wastes in the dairy are greater and can be more easily avoided than the wastes in almost any other industry. The best way to prevent them is to conduct the dairy in a business-like manner. Follow the example of the successful merchant, railroad man or manu-

facturer and dairying will pay. In the first place, every farmer should know what his dairy costs him, and how much he receives from it. Without this knowledge it is as absurd for him to remain in the business as it would be for a manufacturer to sell a certain line of goods for any price at which they would go regardless of what it cost to produce them.

It may not be practicable for the farmer to state the outlay for and returns from his dairy with the same exactness as the manufacturer can, but with very little trouble he can keep a fairly accurate account of his operations, which will serve as a guide in future work. He will find wastes in plenty, and the more in detail the books are kept the greater the number of wastes which will appear. As in other industries, it will be proper for us to consider as wastes in dairying all the losses which it would be profitable to avoid. In other words, there is a waste in the dairy whenever an opportunity to stop a leak or an opportunity to make an improvement is neglected.

A great waste from which almost every dairy farm is suffering, is the failure to make the most of cows by judicious feed and care. Perhaps this is the greatest of all wastes. Think of the loss when one could increase the output of his herd by from 50 to 100 per cent. by a slight increase of feed and a little better care, and he does not do it. Many a good cow has been ruined by neglect, and many another which might have been good has never been developed. These willing animals are commonly blamed for their small returns when the blame belongs to the one who has neglected them. The much-wished-for profits seem to disappear just as they are in reach. A little better care and a little more feed would in many, many cases, increase profits and change losses into gains.

We often hear the cow compared to a machine, and the comparison is a good one. An important difference is that the machine requires one kind of raw material to keep it in operation and another kind to be manufactured into a superior product, while the cow supports herself and makes milk from the one raw material—her feed. Some people seem to think she should run herself on air and water, and will turn all her feed into milk, but this will never make her do it. It is her nature to give milk for her offspring, and she will use a part of her food for this purpose even though she has not enough for the needs of her own body.

But aside from making this small amount of milk, it is the habit of the cow to use as much of her food as is necessary to keep her body in good condition before converting any into milk, therefore, the supply of milk will be extremely small as long as she is underfed.

A large milk flow may be expected only when the 8 or 10 or 15 hundred pounds of bone and tissue are kept in good condition, and it

requires a certain quantity of food to do this. When no more than this sustaining amount is fed, profits need not be looked for. A dairy conducted in this way can be compared to a factory that is running on half time—barely making expenses, but always ready to greatly increase the output at a slight increase in cost of operating.

It would be most unbusiness-like and wasteful to run a factory at a cost of \$100.00 per day to turn out \$100.00 worth of product, when by increasing the cost to \$110.00 the daily output of the factory could be made worth \$125.00. The reward the manufacturer would receive who would operate for running expenses only would be the pleasure of working for nothing and seeing the wheels go round—the one willing to increase the expenses for a greater increase in returns would be paid for his labor.

Many dairies are run by persons so anxious to hold down expenses that they feed barely enough to keep the machinery going, and by this false economy are wasting the gains that might be theirs.

Without going too far into details, which would lead to a discussion of the principles of feeding and caring for dairy stock, let us notice a few of the results of good handling.

The Kansas Experiment Station reports that early in 1898, a number of common scrub cows were purchased in that State to be added to the college herd. They were selected by a farmer who was not a dairyman and were believed to be poorer than the common Kansas cows. It is fair to assume that these cows would have averaged, on the ranches where they were bought, not over 3,000 pounds of milk per year each. They were shipped to Manhattan, Kansas, started on a ration of alfalfa hay, bran and linseed meal, and later given alfalfa hay and Kaffir corn grain. The cows were credited with the butter-fat yielded at prices paid at the nearest creamery, and their feed was charged to them at retail rates. Here are the results for the year:

	Average.	Best.	Poorest.
Yield of milk, pounds,	5,707	9,116	3,583
Yield of butter-fat, pounds,	238	383.7	185.7
Or butter, pounds,	278	448	158
Cost of feed,	\$29 20	\$32 80	\$26 75
Value of butter-fat,	37 75	60 88	21 39
Value of skim milk, at 15 cents,	7 69	12 29	4 83
Total value of products,	\$45 44	\$73 17	\$26 22
Difference between cost of feed and returns—			
Gain,	\$16 25	\$40 37	.....
Loss, .....	.....	.....	\$0 43
Cost of butter-fat per pound, cents,	12.2	8.5	19.7
Average price received for butter-fat,	15.8	.....	.....

In this bunch of cows the average yield of milk was increased more than two-thirds by good care. It shows what can be done in Kansas. In Michigan, the yield of a Holstein cow was raised from 9,255 pounds to 21,075 pounds, the increase being not entirely but largely due to careful feeding and handling. Every dairyman knows by experience that milk yield can be greatly increased by feeding. It is expected that there will be most milk when the pastures are best, and less when they commence to dry up. Those who practice soiling know that the flow can be kept up at times when it is in the habit of failing.

Of course there are many cows that will not give enough milk to be profitable in the dairy, no matter what they are fed, and they will quickly make themselves known, and it is easily possible to increase the feed, even of a good cow, so much that the last of the increase will be unprofitable. There is a limit to her capacity, the same as to the capacity of any machine. The careful feeder will discover this limit and not go beyond it. He will also find that there is a great difference in cows in this respect, and he will feed accordingly.

The dairyman who skimps his cows on feed, and the one who feeds the same quantity to each, are permitting extravagant wastes in their dairies.

Another waste which many think is as important as or more important than the failure to feed for the best results, is the waste of food and labor on poor cows. Again considering the cow as a machine, can you think of a set of machines in any well managed manufacturing plant which vary as much in cost of operation as do the members of the dairy herd?

In the Kansas herd, already referred to, where all were given a chance to do their best, one cow required 19.7 cents worth of feed for each pound of fat produced, while another made a pound of butter-fat for every 8.5 cents worth of feed used. Every pound of fat the first cow produced was sold for 2, 3 or 4 cents less than it cost; every pound of fat made by the other cow was sold for 5, 6, 7 or 8 cents more than it cost. A few cows like the first would soon ruin a dairyman; a few like the last would give him a good income. If he has a few of each the profits of the best may make up the losses of the poorest, and this is the way many a dairy herd is constructed.

It does not take any special business tact or instinct to see that the average cost of butter production could be lowered and the cash profits actually increased and much hard work saved, but getting rid of the 19.7 cent cow, and others which are yielding fat at the greatest cost. If the six poorest cows in the Kansas herd (which produced fat at an average cost of 15 cents for feed) had been removed, the average cost of the herd production would have been reduced from 12.2 cents to 10.5 cents,

A complete published record of the Cornell herd shows that 20 well fed cows varied in cost of production of 100 pounds, or 47 quarts of milk, from 44 cents to \$1.48, and they produced butter-fat for all the way from 11 to 27 cents per pound. The poorest cow required more than two and a half times as much food as the best for the production of a pound of fat. The average cost of feed for the herd per pound butter-fat was 17 cents. If the five poorest cows, which produced fat at 27, 26, 22½, 22½ and 21 cents, had been removed, the herd average would have been lowered two cents, to 15 cents per pound, and if the next five poorest cows, which produced butter for 18½, 18, 17½, 17 and 16 cents, had been taken out, the average of the remaining ten best cows would have been lowered another two cents, to 13 cents per pound for butter fat. Can anyone propose an easier and more effective method of making dairying pay than, first, letting the cows show what they can do; second, getting rid of those that do the poorest.

There is but one way to keep accurately informed of what the cows of a herd are doing, and that is to regularly record the amounts of milk given and its tests or quality. Many persons think that their daily acquaintance with the herd will enable them to make estimates of what each animal is doing. But experience shows these estimates differ widely from the correct figures. One can easily be deceived in the amount of milk given, and still more easily in the amount of fat.

The morning and evening milk should be weighed one day every week; fairly accurate results can be secured by weighing only two days a month. At the same time samples should be taken and tests made. Supposing the days selected to fairly represent all others, the total yields of milk and fat are easily computed. The labor of weighing, testing and keeping records, and the cost of the scales and test, are hardly worth considering when their importance is realized. A dairy without scales and Babcock test is as deficient as a grocery without scales and price list, it is being run on principles which were long ago out-of-date. They are the best waste detectives a dairyman can employ.

The miller has no place for an unprofitable machine, and when he finds one which promises no gain to him it is stopped as short as the grandfather's clock, "never to go again." If he can get rid of it in no other way, it is sent to the scrap heap. The dairyman should be just as prompt to get the poor cows out of his way. He has an advantage over other manufacturers in that his poor machinery is not an entire loss, as the butcher will always pay something for it.

A waste of considerable importance, in districts where feeds are commonly purchased, is the use of an expensive feed when a cheaper

one will do as well. It should be remembered that the feeding value of a food stuff is not shown by its price. Sometimes a high priced material is more economical than a low priced one. Two feeds which cost the same may differ 25 or 50 per cent. in feeding value. Waste of this kind can be avoided by studying the composition of feeding stuffs and keeping a close watch of the markets. The Bulletins of your State Experiment Station, which are sent out free, explain how to save in feeding. There is quite a waste, too, in buying feeds in small lots, as everyone knows.

A waste similar to this last is in failing to take advantage of the sometimes peculiar conditions of the markets for dairy products. A good illustration was seen recently in a southern town. The regular price of milk is 10 cents a quart. Yet some near-by farmers are making butter to sell at 25 cents per pound. Co-operative factories would sometimes find it to their advantage if they could change from butter to cheese, or cheese to butter, when the prices of these articles are not in the same proportion as their costs.

The waste of time and energy in hauling whole milk to the factory, waiting to deliver it, and then returning to the farm with about four-fifths as much load of more or less spoiled skim milk has been the subject of many discussions. The use of the small separator would be a saving in many dairies, and where this is impracticable, much can be saved by letting one team do the work of several. In some parts of the country it is a common practice for patrons living on the same road to haul each other's milk, taking turns for periods of a few days each.

Neglect to properly care for milk is a waste from which many suffer, that is almost as bad as deliberately throwing money away. The highest butter quotations are frequently 100 per cent. above the lowest. There is a waste or an unnecessary loss in the sale of almost all the low priced butter. It is cheap for many reasons, but one of the chief ones is that it was made from badly contaminated milk. The cow is not to blame for this—this milk is good when she makes it, but it is a perishable product and is allowed to spoil. With a little care it can be kept pure and the result will be better butter, and a saving of a part of the price of good butter, which would be wasted.

It would be possible to talk almost any length of time on the subject of wastes of the dairy. If we treated it exhaustively we could discuss every step in dairy work. The failure to profitably use skim milk is a waste which the subject would immediately suggest to many people. And some might think of sad experiences when they were persuaded to invest hard-earned dollars in new machines which promised small fortunes to the few who were "permitted" to purchase them. These credulous persons, who have expected to play

an important part in revolutionizing the dairy business, have perhaps learned good lessons, and if so their losses need not be considered as wholly wasted. Two pounds of butter cannot be made from one—inventive geniuses to the contrary notwithstanding. And there are other wastes which, no doubt, your secretary had in mind when he suggested the subject to me.

If all the wastes of the dairy were to be grouped under one head, it would be the waste of permitting an incompetent person to direct dairy operations. It requires a high grade of intelligence and abundant common sense to manage a dairy, and the men who do not possess these qualities should be weeded out with the poor cows. One man may be able to get his cows to give him butter at a cost of 12 cents per pound, and the same cows in the care of another may double the cost, as we have seen.

There is as much difference in men as in cows—the best are invaluable for the highest degree of success and when such an one is secured he should be encouraged by good pay and kind treatment, as the best cow is encouraged by good feed and kind treatment. It is a great mistake to think that anyone can manage a dairy; yet this mistake is often made, and capable men are offered but little if any more than the wages of the common laborer.

A good manager will save many times the increase in pay to which he is entitled. He saves at so many places and in so many ways it would be impossible to enumerate them. His practiced eye and good judgment are constantly detecting and preventing wastes which the inexperienced person cannot see.

He will be a business man and he will watch the business of others closely enough to make sure that he is not left far behind. For such a person the wastes in dairying must be real encouragement. In other industries wastes are being rapidly reduced and further saving is only possible after hard study and work. It is doubtful if any enterprise now offers so great reward for expenditure of brain force as does dairying.

I do not know a more promising field for an ambitious man than dairying is to-day. If both ends can be made to meet where there are wastes all along the line, what a bright prospect there is for the one who will conduct the business in such a way as to change wastes to gains.

DISCUSSION.

Mr. George Maloney:—I am particularly interested in that part of Mr. Pearson's paper alluding to the costs of the dairy, which is one of the first things to be taken into consideration; the yield of the dairy is the second consideration. In traveling over the country it is surprising to see how few make any effort to see what the yield is.

They get a general idea, but I venture to say not one farmer in 1,000 knows what the dairies are yielding. The minimum cost of production is one of the questions that the Dairy Union should urge.

Mr. H. W. Comfort: One of the greatest losses is the very wasteful way in which the manures are cared for. I have been very much surprised in putting in cement gutters at the amount of dry dirt it takes to properly bank up the gutter.

Mr. W. G. Embree: In regard to weeding out these poor cows, it is a very important problem how it is to be done. We are to-day purchasing cows for \$50 to \$60 a head, and a man cannot tell much about them until they are tried. As a dealer said not long ago, the more he knew about the cow business the less he knew, and the less he could tell the result in the cows he sold. If we test a cow for three or four months and find her not profitable and sell her to men who are buying refuse for probably \$20 a head, there is a loss of \$30 to \$40 on the cows we buy at the present prices. How many can we weed out in that way? How much greater are the losses for holding them than selling at this sacrifice? Half of the cows I have bought of drovers have had to go within a year. There must be a dividing line where this weeding out has to be stopped. Perhaps the speaker can give us some suggestion on this particular question.

Mr. A. L. Wales: I think the discussion of this question should be left until that topic is regularly before us for discussion.

COW FEEDS.

BY W. G. EMBREE.

With reference to cow feeds, we are confronted with a condition which is not usual. The price of corn and fodder, ensilage and wheat has advanced, also the products from which we get the proteins. The high prices which farmers are getting for butter do not cover the additional cost of feeds. Our main dependence is on the corn crop, and how to utilize the corn crop to make our rations as inexpensive as possible is the problem before us. Hay fodder and ensilage are too expensive for dairy feeding, and it is questionable whether the farmer can afford to feed them at all, excepting that it is necessary to give more palatable foods on account of their giving a relish to the stock. We have to balance our feeds with those nitrogenous pro-

ducts such as cotton seed meal, gluten and linseed meal. We have not, so far, succeeded in raising the nitrogenous feeds at home. If, however, cow peas can be raised in Bucks county and in New Jersey, there seems to be no reason why they cannot be raised here. We are dependent upon our home products which are largely carbonates, and make an unbalanced ration. The standard at the Experiment Station is a proportion of 5.4, and that seems to be taken as a basis of scientific proportion in feeding. The question, however, arises whether that ration as established in Germany is the one that is best suited to our climatic conditions. It is said that the 1.4-5 ration is about the same as June grass. That would come very close to the scientific proportion if that be the case, but we must remember that our winter feeding is not done in June.

We have a change as well as variation of season, to overcome in our feeding. As we go on to the winter season the carbonaceous foods are those which furnish heat and energy, and it would seem probable to a farmer that the colder weather would require a more carbonaceous food than in the summer season. Also, as the weather increases in severity or the cattle are more exposed there would be a still further increase needed for the maintenance of heat, especially in our dairy barns. I have been looking for some authoritative statement of this thought for sometime and never came across one until last night in conversation with Professor Voorhees, who said that that was to a large extent the case, that we have a certain amount of cold to overcome, and that our heat producing foods were the chief remedy in overcoming the difference in climate. In the winter weather we ourselves have a relish for the carbonaceous foods which seem to indicate that we have a need for them. Dr. Kane in his Arctic expedition speaks about the enormous amounts of very fatty food the men consumed, that they seemed to relish the blubber fat. In the West where they have growing the alfalfa and cotton seed, it seems that the desired results might be obtained by a narrow ration, but here where we have the carbonaceous foods, it would seem to be wise to have a ration of 1.6 and 1.7 for the severest weather.

In addition to that, there is a certain amount of waste from the difference in digestion of the animals. Where there must be some waste it would be better to have the excess of the carbohydrates as they are the cheapest forms of food.

It is also necessary that there should be a certain amount of bulky food. An old farmer said not a great while ago that he found he had to keep the cows full all the time to get the richest product. Some years ago when I began dairying I thought it would be better economy to feed the cows all that could possibly eat of the richest food.

I thought they had to have a certain amount to sustain the constitution and that every thing beyond that would go down into the pail and be increased profit. I kept feeding increased quantities of the stronger feeds until the amount rose as high as half a bushel a day. I put the cows in full milk, but did not get the results I had looked for. The animals filled themselves with the strong feed, but did not take enough of the coarser food to give that proportion which was best for the digestion of that kind of animals, and the feeding was done at a loss. I finally came down to a proportion given by the Experiment Station of about two of the coarse fodder to one of the ground or meal feed. At one of the Experiment Stations where a similar experiment was tried, a ration was given entirely of corn and the animals were bedded with sawdust. When the excreta was examined vegetable matter was discovered, and it was finally learned that craving a coarser food, they had eaten the sawdust with which they were bedded.

It has been the custom in years past to feed the corn fodder in the yard. The cattle eat about one-quarter of it and the rest goes to waste, or to the formation of manure. There has been much effort to try to utilize this corn fodder. Cutters have been tried, and in many cases it has been impossible to have the cows take enough of the corn fodder to satisfy them. Sometimes only the fine has been taken, but this leaves a great part waste. The Tornado cutter which slices it about one-half to two inches long, puts the fodder into condition that they can eat it without much trouble. A shredder has been brought about for putting it into a better shape for eating. I have tried both methods, and my stock, a herd of Jerseys, will eat that cut by the Tornado cutter into strips more freely than that cut with the shredder; whether the shredder was doing its best work I cannot tell.

There is a party in Philadelphia who is grinding hay and different kinds of corn in certain proportions, by which they claim to make a scientific feed for horses. That suggests at the same time that there may be a machine for grinding the fodder and obtaining the greatest value of it which is really in the stalk below the ear, and in the outside shell of the stalk, as the pith has not a very large feeding value. In Kansas they are utilizing fodder in that way and claim as good results as from the silage machine made in Chicago.

Also, we have derived a good deal of benefit from the silo, which puts the fodder into much better condition than any machinery we had to operate. The fact is, the cattle have a relish for the silo which they do not have for any fodder.

In regard to rations, I have made a list which I have taken from the balance of the Pennsylvania Station of the United States Department of Agriculture. Taking 25 lbs. of ensilage, 10 lbs. of

corn fodder, 5 lbs. oats straw, used for increasing the bulk, we get 1.96 of the protein and 16.87 of the carbohydrates or a ration of 1-8, the cost of which is 13 cents a day at the market price and the selling price on the farm.

	Fresh wh.	Dry Subst.	Protein.	Carbo Hyd.	Ratio.	Cost.
Ensilage,	25	7.00	.275	4.55	.....	.025
Stover,	10	6.00	.02	4.61	.....	.0225
Oat straw,	5	4.50	.07	3.20	.....	.0125
Bran,	4	3.52	.48	1.82	.....	.036
Cob meal,	2	1.70	.08	1.82	.....	.01
Cotton seed meal,	2	1.85	.86	.87	1:8.6	.025
4 q.—4 lbs.,		17.50	1.96	16.87	.....	.131
		7.07			.....
		24.57			.....

	Fresh wh.	Dry Subst.	Protein.	Carbo Hyd.	Ratio.	Cost.
Ensilage,	25	7.00	.275	4.55	.....	.025
Stover,	10	6.00	.20	4.61	.....	.0225
Oat straw,	5	4.50	.07	3.20	.....	.0125
Bran,	6	5.28	.72	2.73	.....	.054
Cotton seed meal,	3	2.77	1.29	1.295	1:6.4	.0375
		17.50	2.53	16.385	.....	.1515
		8.05			.....
		25.55			.....

	Fresh wh.	Dry Subst.	Protein.	Carbo Hyd.	Ratio.	Cost.
Ensilage,	25	7.00	.275	4.55	.....	.025
Stover,	10	6.00	.20	4.61	.....	.0225
Oat straw,	5	4.50	.07	3.20	.....	.0125
Bran,	4	3.52	.48	1.82	.....	.01
Cotton seed meal,	4	3.70	1.72	1.74	1:5.4	.05
		17.50	2.745	15.92	.....	.11
		7.22			.....
		24.72			.....

These are about the costs of the rations in this part of the country this year. In our way of feeding we make it a rule as far as possible to feed our cows on corn feed in proportion to the amount of milk that they give. To a cow giving four quarts of milk we would give four quarts of corn feed. I would not increase the feed beyond ten quarts, because it would be out of proportion, and would not be thoroughly digested. Neither do we fall below three quarts, because it is necessary to give strong feed to keep up the constitution. Reckoning the cost of the feed at $1\frac{1}{2}$ cents a quart, which is about the average, the milk costs in feed alone $1\frac{1}{2}$ cents a quart.

A farmer could not be made to believe that a chemist or experiment station could make up any balanced ration that would yield the result which comes from the fresh grass.

DISCUSSION.

Mr. Gross: In Bucks county some time ago we used to chop the corn on the cob for the cattle, and later on when the corn cutters came we sold our corn and now farmers are beginning to use the cob; the idea is suggested as to whether using cob meal is more economical. And then another question, if as I understand the food value of the corn stalk is below the ear, why is the fodder cut off knee high?

Mr. Embree: We cut our corn fodder as low as possible because we utilize as much as we can. That left in the field cut three feet high is certainly a waste, and those wastes we shall have to learn to use. In regard to the corn-cob meal, most of the experiments have been in favor of the cob meal on account of the bulky condition. I changed the feeding once from cob meal to corn meal and the cows fell off in the amount of milk.

Mr. George I. Carter: I should like to ask if the speaker has ever used malt sprouts? Analysis shows 26 per cent. of protein. They make a rich food and do not cost as much as gluten meal.

Mr. Joseph Sharpless: I would like to ask if cows fed on ensilage and nothing else, will do well.

Mr. J. Haldeman: I have 15 to 20 new heifers coming two years old, fed on ensilage, but I find that it is not a properly balanced ration.

Mr. Joshua Jeffries: The question has been raised as to whether the richness of the milk could not be increased by feed. I know that cows fed on cotton seed meal with no increase in the yield of the milk gave an increase of 10 to 15 per cent. in the quality.

Mr. Joseph Sharpless: I would like to ask whether foods given in the fall of the year will give a richer milk than if given in the spring.

My experience is that you cannot make a cow that has given four per cent. milk with any kind of food, give 5 per cent. milk. Perhaps she will decrease to about 3.8 per cent. by poor feeding; and then by judicious feeding you can get her up to 4.10 or 4.20 per cent., but you cannot make her give 5 per cent. milk by giving her any kind of food. I think the Experiment Stations teach that if you are feeding a well balanced ration you cannot increase the amount of fat by feeding. You have to breed for quality and feed for quantity.

Mr. George Abbott: This subject has engaged the attention of many dealers for a great many years, and the ground has been so well established both in Europe and in this country that you cannot materially increase the fat in milk by feeding, that it is almost past discussion. I think it may be stated that while you cannot feed fat

into the milk you can feed it out of it, which is putting the remark made by Mr. Sharpless in another form; if a cow is fed so that she is not producing the fat she might, by increasing the richness of the food the test of the milk will be higher.

Mr. Embree: That you cannot increase the fat in milk in normal conditions is acknowledged I think by all Experiment Stations. I am very certain that where a cow is fed in rations not very digestible there is a falling off in the quality of the milk. I know this by actual experiment. There are probably involved some things which the chemist does not understand. A sloppy food will lessen the percentage of butter fat.

Mr. Snyder: With reference to the inquiry of Mr. Sharpless as to whether the same foods will produce a richer milk given in the fall, I would say that we have the winter dairies and always have the low test then because the cows are fresh. It has been my experience that if a cow is fed to her full capacity she will produce the quantity as well as the quality of milk. If she is not fed up to her capacity, the quantity will be reduced more than quality will, that is the percentage of butter fat in a cow not fed to her capacity is proportionately higher than the quantity.

COW STABLES.

BY DR. LEONARD PEARSON, *State Veterinarian.*

We find that the progress made in regard to cow stables is far less than that made in other points in connection with dairy interests. Most of the stables in which cows are kept were built for some other purpose. At one time many of the farms were grain farms and feeding cattle was practiced to a large extent, and in those days the cattle were not housed as they are now. The conditions were in many other respects entirely different from those of to-day. Cattle were not housed as they are to-day, and were less susceptible to disease.

In order to have a stable which will keep cows healthy, it is necessary to have it meet modern requirements and so built that it can be readily disinfected. To summarize these requirements we would say that a modern stable must be kept clean, comfortable, convenient and disinfected. In order that a stable shall meet these

requirements it is necessary first of all that it shall be a light stable. Light is conducive to cleanliness; a dark stable is usually a dirty stable. Light has a distinct effect upon the physiological processes of the animal and increases the resistance of the animal to disease. It helps nutrition and in other respects helps to make the animal strong and resistant. This has been believed for a very long while, but it has recently been demonstrated by some experiments that have been conducted under the auspices of the State Live Stock Sanitary Board. Animals have been placed in dark stables, and a parallel set placed in a light stable. The conditions were exactly alike as to exercise and extent of exposure to disease, the disease being tuberculosis. The animals kept in the light stable were pigs, calves and guinea pigs, and resisted disease longer than those animals kept in the dark stable.

It is also interesting to observe, what has been known practically for a long time, that animals increase in weight faster for a time in the dark than in the light, but after a certain period they lose weight. This is a strong argument against keeping cattle in the dark permanently and against raising them for several generations in dark stables.

The importance of air, of ventilation, is another thing that cannot be dwelt upon too strongly. There are so many stables in which there is no special provision for ventilation. In ventilation it is desirable that the air should be removed from as near the floor as possible because there it is worse than at the top of the room. The cow breathes down toward the floor; the excreta are all on the floor; fermentation is going on on the floor and for these reasons the air should be withdrawn from here. If it is taken from the top of the room you lose the good air and the heat. In a properly equipped and perfectly ventilated stable there is a metal ventilating shaft in each corner of the stable which comes up through the roof and is surmounted by a ventilating cap which permits the wind to blow down, which by suction draws the air out. The fact that the shaft is made of metal allows it to be warmed to the temperature of the air. Careful observations have been made as to the directions of the currents of air, during a large part of the winter. Little pieces of tissue paper were suspended by strings and the least current could be detected. It was found that there was a current of air outward, and that the cold air did not come down. The air came into this stable through a box on the door. A slit was cut in the door about six inches wide and four inches long across the entire width of the door and the box placed on the door inside, so that the air in coming through was directed upward and went pretty nearly to the top of

the stable before it began to fall and in that way was so warmed that no direct draft was felt by the animals.

Another important thing in all stables is the character of the floor. The dust cannot be kept down in a stable—and that means that the bacteria cannot be kept down—if the floor is dusty and of such nature that fragments of it are constantly rising. The atmosphere of the stable cannot be kept pure if the floor is not waterproof. The floor should be smooth, hard and waterproof, and I know of nothing that gives as good results as cement. This can be made by almost any one. It is not expensive, very durable and exceedingly satisfactory. The objection is urged that a cement floor is too hard and too slippery, and not comfortable for the cattle, but it can be made after a rough fashion so that it will not be slippery, and if it is bedded sufficiently, it will not be hard enough to injure the animals.

I have noted six cows kept in such a stable for a year and a half with practically no exercise, and another lot of six cows standing on a dirt floor. There is not a cow with a sore foot in the stable with cement floor, but there are two with sore feet in the stable with the earthen floor. A good floor may also be made of ordinary paving brick, cemented to keep the water from soaking down.

As to mangers and fastenings much could be said, but perhaps it is enough to say that the cattle tie should be comfortable for the cow and should keep her in her place. I believe that the swinging stanchion makes a most satisfactory cattle tie. The manger should be open and exposed. The manger in the stable I have spoken of is four inches from the floor.

It is desirable to have partitions between the cows heads, and some think it is desirable to have partitions coming back part way to keep the cows apart. The reason for a partition between cows heads is that unless one uses special care to keep tuberculosis out of his herds he is likely to occasionally buy a tuberculous animal, and if the heads are not kept apart the opportunity for the extension of the disease in that herd is very much greater than where there is a partition between the animals. The argument for partitions running backward between the cows bodies is that the cows will sometimes injure each other by sitting on one another. There should be no dark corners or unused spaces in cow stables because these are conducive to the accumulation of trash. The walls and ceiling should be as smooth as possible that they may be washed or whitewashed.

To build such a stable is not as expensive as one might think. It has been believed for a very long time that the conditions that I have mentioned are conducive to health, and that it pays to adopt them. There are a number of farmers in this neighborhood who have built stables which fulfill all the requirements. There is a stable in

Thorndale which is perhaps the best cow stable in Pennsylvania. There has always been some reluctance to accept statements in regard to the value of good sanitary conditions, and many have said that there is really very little use in them, because cattle have been kept so long under these old conditions and have been kept so well that there is no use in changing the conditions. For the purpose of making a definite test for the value of sanitary stables, the State Live Stock Sanitary Board about two years ago constructed two cow stables. They are under one roof, but are completely separated by brick wall. Each stable is for six cows. One is 30 feet long and 22 feet wide. The other is 13 feet wide and 22 feet long. One has light on three sides, has lots of windows. The other has two windows that have been kept closed or screened by blinds. A year ago last summer eight cows purchased in Ohio were tested with tuberculin and found to be entirely free from the least trace of tuberculosis. Four of these were placed in each stable, and in addition, two tubercular cows were placed in each stable. The tubercular cows were changed every ten days so that each set of healthy cows would be exposed to the same degree. The experiment is now completed, and it has been found that the four healthy cows placed in the dark stable responded to the test, while only two of the cows in the light stable reacted to the test. I have here some photographs of the interior of these two stables which I will pass around. You will see that in the light stable the air space is ample; you will see the metal ventilating shaft, that there are many windows and that the walls and ceilings are smooth, so that they can be cleaned and disinfected. In the other stable you will see that the walls are of rough brick, the ceilings made of board with space between them and straw hanging down and some cobwebs, and the stable has an earthen floor. This is the stable in which animals contracted tuberculosis to a remarkable extent. The cows were cared for in exactly the same way as to food and exercise, although there was little exercise in the case of either lot of cows.

I think we have reason now, perhaps stronger reason than before, to say that good sanitary conditions are desirable and that good sanitary conditions are beneficial.

DISCUSSION.

Dr. Pearson being asked his reason for saying that animals would fatten better in dark stables, replied that the exact reason he believed was not known, but that it was supposed the nutritive changes in the body are favored more by sunlight and occur more rapidly than in the dark. Further examinations, however, were needed to determine that.

Mr. Carter: Do you mean to say that there was no contagion among the cows in the light stable?

Dr. Pearson: I mean to say that in the dark stable all the cows contracted tuberculosis; in the light stable only half were infected.

Mr. Maloney: Were the same cows put in the one stable?

Dr. Pearson: The arrangement was that each healthy cow stood next to an infected cow.

Mr. Sharpless: How was the disease conveyed from one cow to another?

Dr. Pearson: The disease was conveyed in part by the dried expectorations which are inhaled. When the tubercular cow coughs, a certain amount of spray comes from the respiratory passages which contains tubercular bacilli. Another source of infection was in the healthy cow eating from the same place of feeding. I would recommend that cows all the time occupy the same stall.

THE ECONOMY OF RAISING CALVES TO REPLENISH THE DAIRY.

BY J. T. TRUMAN.

There are two methods of keeping up our dairy herds; buying from the dealers, and raising the calves. The first thing that occurs to us when attending a sale and looking over a large number of cows is, that we know nothing about their pedigree nor the conditions under which they have been raised, and so that very important part of the cow's history is blank to us. Our judgment may lead us to suppose that she will give a large flow of milk for a great number of days, and sometimes she turns out as we thought; sometimes she turns out exactly as we thought she would not. You who are used to breeding cattle know that the ability to wisely select an animal is greatly aided by our knowledge of that animal's ancestors.

Another objectionable point in buying cows, is the age of the cow. A great number of the cows brought to this State for sale show unmistakably that they are not heifers, but cows of from 7 to 10 years old. A buyer thinks he can get a year's good use out of the cow and he often pays the price of a cow in her prime.

A third objection, is the danger of disease being introduced into our herds. This State has wisely made protection against tuberculosis being transmitted from animals from one State to another, but there has been no provision made to stop the spread of tubereu-

losis from one county to another in our own State. I had an example of this recently myself. I bought three cows at a sale, but before bidding asked the dealer if they would be sold subject to the tuberculin test. He said he had not thought of it and that probably the cows were all right, and that if any failed to stand the tuberculin test he would take them back. One of them was found to be tuberculous and was returned. I might easily have introduced tuberculosis into our herd, to what an extent I do not know.

The fourth objection, is the price paid for the cows. The value of a cow is perhaps pretty hard to get at; there is a difference of opinion as to what is the top price we should pay for a cow, but the average price would come near to \$50. Admitting that is not too high a price, can we get a good cow for less?

Taking the other side of the question, the first thing in favor of raising our own cows is that we know the ancestry. We have here a good cow that we have been milking for a number of years, and one that has milked 11 months out of the 12 and given four or five thousand pounds of milk a year. We want to raise calves from that cow, and if we get a good sire, the likelihood is that we shall perpetuate the giving of these 5,000 pounds of milk yearly. We might have just these conditions, and yet by some hook or crook not get the wonderful cow you expected. But the percentage of good cows in that way is greater than of those raised otherwise.

The second point in favor of raising our own calves is the cost. In the first two weeks I feed nothing else but new milk. The first three days milk is not worth anything to sell, and I therefore figure the cost at nothing. I have figured the total cost for two years at \$32.53. I say two years, for after that time a cow should be self-supporting. Don't raise a calf that is born six weeks before it should be, and has but two teeth.

The third point is the long term of usefulness; the cows you buy at sales have only a few years before them. In the cow raised, you have one good for twelve years.

The fourth reason in favor of raising our own calves is freedom from disease. Even if by accident we have a heifer two years old that does not promise to be a good cow, she has cost us only \$30 and she is worth that for beef.

Besides these points, there is to my mind the added enjoyment and zest in the care of the animal when developing my herd in this way. You see in each cow a production of your own skill. You have selected the sire and dam and you have fed the cow, and you know each one from birth up. The moral and intellectual advantages to be gained are very much in advance of this haphazard method of buying at a sale, and the profits I am convinced are ahead of that method of buying fresh cows instead of raising them.

DAIRY MATTERS.

BY GEO. A. SMITH.

• When Prof. Hayward invited me to come here and talk on the subject of dairying, I felt that while I was pleased to have the opportunity to meet the dairymen of this section of Pennsylvania and discuss the subject with you, that it was extremely doubtful whether I could say very much about the business that you do not know. The most I could hope was that by bringing up some of the points which I believe are of vital importance to our business and discussing them, we may get some new ideas which will help us to form a plan by which we may succeed in competition with the western dairy farmer.

If the older farmers here had been told twenty-five years ago that in 1899, the majority of the commercial butter manufactured in the United States would be produced in what was then known as the far west, that the State having the largest number of milch cows would be situated west of the Mississippi river, they would have said the persons making such statements were out of their heads. Still such are the facts. To-day Iowa has more cows than New York, which was for a long time the banner dairy state; Illinois has more than Pennsylvania; and the same is true of many other western States, compared with the eastern. With these facts before him the eastern dairy farmer is beginning to realize that if he is to be a factor in the dairy business of the country, he must throw aside the prejudices of past generations and accept modern methods and ideas. The manufacturers of all classes of goods have found this true. Old-fashioned machinery has had to go if the manufacturers kept in the race. Competition is so strong with them that the price is driven down to a point where the profit largely depends on getting a maximum production from each machine. It is very much the same with the dairyman. While prices have been higher this year, owing to the extensive drought shortening production, he cannot count on a continuation of these conditions. The only safe proposition for him to figure on is that the western farmer with his cheap grain is going to make all the butter he can, and that he will produce all that he can in the winter when the price is highest, which is an entirely different system from that which the eastern dairy farmer has been accustomed to. It is not to be wondered at that this new plan is hard for us to accept.

When our forefathers first settled in this country they brought with them a cow or two for the purpose of supplying a little milk and butter for the family; there was no idea of making the milk a money crop. As we all know, circumstances were such that they lived largely within themselves, producing nearly everything they required on the farm. It was difficult for them to do differently, as the means of transportation were very limited, and if it had been otherwise there was no market available for any surplus they might have produced. Under this system they became accustomed to having their cows come fresh in the spring and dry through the winter, packing the surplus in the summer for the winter supply. As time passed and there began to be a market for dairy goods, the farmer gradually increased the number of cows kept, but he made no other change. He followed the same system of summer dairying and keeping the cows through the winter without any income, in many cases up to within a very short time, he has followed the plan of his grandfather of turning them in the barnyard to live on what they could get out of the straw-stack and sleep in the adjoining shed—a system that cannot be conducive to large milk yields.

When the western farmer first came into the eastern market with his fresh made butter in the winter and gradually took away the market for summer packed butter, our eastern dairyman was in rather a demoralized condition. He had all the notions and prejudices that had come down to him through the years in which the business had been growing up from nothing to its present condition. When you talked to him about changing his methods to conform to the new order of things, keeping only his best cows, feeding better foods combined in a better way so that the cow would get just what she required, told him that the cow was a machine, and a very delicate one too, that she could do her best only when she had the best raw material to manufacture milk and milk fat out of, he simply looked at you with unbelief pictured in his every movement and if he condescended to make any answer it would be to say that it was all nonsense to talk about there being any such difference in the quality of milk or in the ability of cows to make it as was claimed, and that the people that were talking about it did not know anything about the business practically.

There is too much of this feeling to-day in many of the older dairy sections of the east. When you say anything to one of those farmers about not getting so large returns from his dairy as he should, or tell him that he cannot make any money with the class of cows he is keeping, he will answer you by saying that he has no money to buy any others, and does not believe it would pay if he had, to put so much money into cows; that the man that reported such big yields did not make any more money than he has, because he paid out all

the extra money he received for grain to feed the cows. In some cases this is true. The man that has been partly converted to the new dispensation and has started putting a large quantity of expensive food into poor cows has usually come out at the end of the year with very little to show for his work, and quite often the balance is on the wrong side of the ledger.

Then there is that other man who says the special dairy type is all wrong; that the general purpose cow, as he terms her, is what you must have to succeed, because you have a large frame and a tendency to take on flesh, so that when the milk production is not satisfactory you can turn about and make beef of her. My experience is that the last man is not very much more of a success as a dairyman than the first. He usually does not have very much net money to show at the end of the year. These two classes of dairymen have made it very difficult to convince the other man that there was a way in which the business could be managed to make it profitable. I think you will agree with me that the influence of the man who fails in any business, no matter whether from bad management or any other cause, has the effect of making the onlooker doubtful as to whether any one can succeed. I am not going to say that every one can succeed in the business of dairy husbandry. The person that has no love for domestic animals had better keep out; if he is already in, he had better sell out. I do not believe it is possible for such a person to succeed in this business. You will find that the successful dairyman is always looking after the many little things about the barn and premises that together conduce to the comfort and well-being of the animals under his care. When he goes about where they are they will show by their actions that they know he is their friend.

To go a little outside of this subject, the foregoing is very well illustrated in the keeping of hens. A person reads of what wonderful profits can be made keeping hens and becomes very enthusiastic and starts into the business thinking to make a fortune in a short time. He goes to quite a large expense in putting up a building on the most approved modern plan. He buys some hens that are recommended to be the best, and to finish, he purchases a quantity of food that the paper said was the one thing that would make hens lay. He has no previous knowledge of the business, no love for it; the only idea is to get money out of the production of eggs by those hens. The result is a failure in almost every instance. We see it more plainly in the latter case, because it is usually made a specialty, while the dairy business is combined with other farm work, and we do not realize the loss to any such extent, but it tells in the end, as we have seen in many of the dairy sections in the last few years.

One of the serious obstacles to the success of the farmer is a lack

of co-operation and organization. We can readily understand why this is so. His work is isolated and does not bring him into contact with his neighbors as the work of most other laborers does, with the result that he is not willing to accept the advice and counsel of others in the same line of business in which he is engaged. The tendency of the times is toward combination. The professional men get together and discuss the difficult problems that they find; the manufacturers do the same, and lately, they have formed trusts in order that they may combine the best executive ability and so lessen expense in their line of work. The different trades have their unions and all work together for mutual benefit. The only man that appears to desire to go it alone is the farmer. We hold meetings like the present one, but they are attended, as a rule, only by the successful farmer, the man who needs the help does not come. The basis of true prosperity in any line of work is that each individual engaged shall be reasonably successful. This can only be accomplished by organization and co-operation and a better understanding of what is required of the individual farmer in order to make the business profitable.

The farmer who keeps one cow that only makes one hundred and twenty-five pounds of butter in a year is one of the factors that is working against profitable dairying. One hundred and twenty-five pounds of butter at fifteen cents is eighteen dollars and seventy-five cents. You could not winter the cow on less than two and a half tons of hay, which at ten dollars per ton, is twenty-five dollars, which makes a loss, without counting pasture and all other expenses which would enter into the keeping of the cow during the year. I bring in this illustration to emphasize the point of cause and effect.

You acknowledge that such a cow would lose money, but say that man's management has nothing to do with the business. Are you sure it does not? If a certain market has a demand for one thousand packages of butter and you crowd fifty packages more on to them, the result will be to lower the price, and all suffer by the overproduction caused largely by the keeping of those poor cows by unthinking farmers, who charge their lack of success to nearly everything but the real cause. If all the farmers supplying that market were working and counseling together for mutual benefit, and in that way were securing a small profit, a little overproduction would not be so hard to stand; but when quite a part of them are like our one-cow man, then a little lowering of the price means hard times in that community, especially when the price to begin with is lower than the farmer can really afford. This is one reason why I say the farmers should counsel together and by doing it avoid overproduction from the unprofitable animal as much as possible.

Very often when anything is said to the farmer about the poor cows in his dairy and not paying to keep them, almost without exception has three arguments that he brings up against it; first, that he has not the money; second, if everyone was to adopt the plan of keeping only good cows, there would not be nearly enough to go around; and third, if it could be done, the market would be swamped by overproduction. I am willing to allow that these arguments are all good, and would advise going about making the change in just that way, only in the exceptional case where a person is starting in the dairy business, when he would be foolish to buy an ordinary cow, as he can usually buy the best for ten to fifteen dollars more. But the man who has a dairy and has made up his mind that the business does not pay in the way he has been managing, would not show good business judgment by trying to make a radical change at once. It would be much better to begin by carefully weighing and testing the milk of all the cows, if he has not already done so, and in that way determine which cow has the ability with good care and feed to produce an amount sufficient to pay to keep and use her as a foundation for a better herd, then dispose of the rejected ones to the best advantage he can. The next step is to purchase a sire of the breed he likes best, that is a good individual from a family of good producers, and in that way build up a good profitable herd.

The next lesson the dairyman must learn, if he has not already done so, is that his good cow cannot make large returns from poor refuse food. The best modern loom is not a profitable investment to the manufacturer unless, in the first place, he has a person who knows how to handle it, and then furnishes the best raw material to put in it. The good cow requires the same thing; first a man to feed and care for her, who realizes that the animal under his care is a highly sensitive machine easily affected by adverse conditions; that she can not be left out exposed to cold raw winds and storms in the fall and winter; that dogs, wild boys and ugly hired men are not conducive to a large flow of good milk; that if you compel her to grind up ripe timothy hay, musty corn stalks and straw to maintain the heat of her body and keep the machine going, you must not expect large returns in the milkpail. If the vital energy is all used up in digesting out of the raw material enough food to keep the animal alive, you must not expect a manufactured product; in other words, your cow has no miraculous power of making something out of nothing.

In this connection, showing what the cow does under normal conditions with food consumed, I wish to quote from a late article in the Rural New Yorker by Dr. Jordan, Director of the Geneva Experiment

Station, in which he gives some facts taken from the study of the dairy breeds, while he was connected with the Maine Experiment Station. The cow which he takes for the illustration was a Jersey weighing about 870 pounds. She gave in a year 6,540 pounds of milk, containing 987 pounds of solids. This, taken as a single statement, seems scarcely worth comment. But stop and think, her weight was only 870 pounds and contained as large a proportion of water as Lawes & Gilbert's well fed ox, so that the dry matter in her entire body would not be over 295 pounds. This shows that she manufactured in a year milk solids equivalent in weight to the dry matter in the bodies of at least 3.4 cows of her size. A comparison between the productive capacity of this cow and two steers 33 months old, that were killed and the bodies analyzed at the Maine Station, shows for the steers an average of 462 pounds of solids which took them two and three quarter years to construct. The cow produced as large a quantity in five and three-fifth months. This was a carefully conducted experiment in which it was possible to know what that cow accomplished with the food consumed, and we have every reason to believe that what was true in her case would be true with every cow producing a large amount of milk. This should convince every man who keeps cows that if he wishes to get the most possible out of her, it is out of the question for her to accomplish the wonderful work that she does unless she has the best care, good pure air to breathe and plenty of good digestible food, not too much, but enough so that she will keep toned up to a good normal physical condition.

I wish to make one illustration to show the difference in the ability of the individual cow to produce milk under equal conditions. It is the record of three cows in the station herd at Geneva which were bought last year for our dairy work. They are about the same age and weight, not far from nine hundred pounds. They have each had practically the same food and it has cost, figuring the expense of securing the alfalfa and silage as near as I could, to keep them the year, \$47.50 and the production has been:

	Fat.	Butter 15 per cent. Moisture.
No. 1. 8,000 pounds of milk testing 5.6 per cent.,....	448 pounds,.....	515 pounds at 20c, \$103.00.
No. 2. 6,000 pounds of milk testing 4 per cent.,....	240 pounds,.....	276 pounds at 20c, \$55.20.
No. 3. 4,600 pounds of milk testing 3.8 per cent.	175 pounds,.....	191 pounds at 20c, \$38.20.

This shows a profit on No. 1 of \$55.50, on No. 2 of \$7.70 and a loss on No. 3 of \$9.30. If we take the product of milk and sell it at 2 cents per quart:

No. 1. 3,720 quarts milk @ 2 cents, \$74 40. Profit, \$26 90.

No. 2. 2,790 quarts milk @ 2 cents, 55 80. Profit, 8 30.

No. 3. 2,140 quarts milk @ 2 cents, 42 80. Loss, 4 70.

If we make cheese and sell at 9 cents a pound, then the account will stand:

No. 1. 1,080 pounds cheese @ 9 cents, \$97 20. Profit, \$49 70.

No. 2. 660 pounds cheese @ 9 cents, 59 40. Profit, 11 90.

No. 3. 403 pounds cheese @ 9 cents, 36 27. Loss, 11 23.

This I think you will agree is a fair test of these cows. It shows the difference in their individual ability to digest and assimilate food and manufacture milk from it. You will probably say that this is an extreme case, which I acknowledge; the best cow is an exceptionally good one, but no better than hundreds of others, and no better than every farmer who observes the laws of breeding can have a good many of if he will make the effort. The poorest of these cows, measured by the ordinary standards would be considered a very good animal, but with our conditions as to cost, she shows a loss anyway that we use the milk at the prices named.

I have said nothing as to the value of the manure, or skim milk in buttermaking, I have allowed that to offset the labor cost. I expect some of you will say the cost of keeping is excessive, and I will allow that with the cheap land for pasturing the cost might be reduced. It could also be reduced by feeding less grain, but when you do that the chances are that you would reduce the production so there would be no gain. So far I have been talking about the machine, the man that operated it and the raw material that went into it. Perhaps I have taken too much time on this part, but one thing is very sure; permanent success cannot be secured in any business unless it is established on a sound basis, and for that reason I have taken more time trying to enforce on your minds those points which I believe are of primary importance. When we have our good dairy in working order, the next question is how to dispose of the product in order to secure the largest returns. In giving the yield of milk of our three cows, I have given the per cent. of butter fat in each cow's milk, and the value manufactured into either butter, cheese, or sold as raw milk, and you see there was only a small difference in the case of No. 2 and 3, but with No. 1 the per cent. of fat being so much more, it makes a considerable higher value when manufactured. So it depends upon the per cent. of fat in the milk of your herd what disposition had best be made of the product; that is, if you have only ordinary market conditions. But when the dairyman is so situated that by furnishing an article better than the ordinary and catering to the especial tastes of his patrons, he may be able to obtain a considerable premium over market rates in some particular line, the

dairyman that has these opportunities has only himself to blame if he does not make a success. If the question should be asked, what are the principal requisites for success in the manufacture of dairy products, I should be obliged to answer: "Cleanliness first, last and all the time." A neat, clean, tasty appearance goes a long way in securing a customer; then if the inside is satisfactory there is not much danger but that that person will be looking for your goods, and at a good, fair price. We often see an article written by some successful butter or cheese maker in which we are told that if we only ripen our cream in a certain way, or do so and so with the curd, we will be sure to have a fancy product. It was all true, probably, from the writer's standpoint, but might not apply in every other case. But if it had been said that every farmer who furnished milk to their manufacturing plant was scrupulously clean and neat, with everything pertaining to the milk he delivered, and as a result there was no trouble in producing a first-class article every time, and every one seeing the statement, who was at all conversant with the handling of milk, would believe it. It is one of the most difficult things in the whole business to convince most farmers that it is really necessary for them to be so extremely careful. That the dust and cobwebs overhead in the barn where the milking is done should be swept down so that there is no collection of bacteria to be stirred up at every gust of wind and drop down on the animals and so get in the milk to start it on the road to putrefaction; that the ventilation of the stable should be as near perfect as it can be made in order to remove the foul air and bad smells, so that the animals will be healthier from having pure air to breathe and the milk in better condition to make a first class product; that the man who does the milking must be always cleanly in his habits and way of doing his work, and that the milk utensils are as clean as boiling hot water can make them, are difficult propositions for the person who has not had the experience in manufacturing the milk to understand. He acknowledges that they are all good things to do, but that it is impossible to secure the finest product only as those things are done is hard to believe. It is nevertheless true. While it is possible to overcome those neglects to an extent by skillful handling, the high flavored perfect product can only be secured by having perfect cleanliness in every detail of the work from the start to finish.

The next important point is temperature, extreme changes in which must be avoided in the handling of all milk products. It is very easy to spoil the cream which was perfect at the start through failure to maintain proper temperatures. I will not set any particular point, because different conditions require different temperatures and every butter maker must learn from experience the particular point which gives him best results.

In the manufacture of cheese all that I have said about cleanliness and temperature is especially true. We have the two elements in milk, fat and casein, to deal with, and the casein is the only part which is especially susceptible to putrefactive conditions, consequently every care must be used to avoid exposure to conditions which are liable to produce taint.

We have lost a large part of our export trade in cheese simply because we were not willing to conform to other people's wishes and give them what they wanted. That same old prejudice against any change in our methods held, and the result was, that the Englishman took our cheese as long as he could not obtain his supplies from any one else. At the present time Canada has the bulk of the export cheese trade; she obtained it by giving to the Englishman the kind of cheese he liked, and is liable to hold it. Every year some of Canada's brightest men go across the ocean and study the demand, and come back and post the producers, who are willing to accept the instruction given and put it in practice. When we lost that trade it left a large surplus on our market and prices went down to a point that left no margin for the dairyman. If it had not been for the large increase in the consumption of raw milk, it is difficult to say what the outcome would have been. If the American people were cheese eaters it would be a different proposition, but we are not; statistics show that we only consume about three pounds per capita, while the English use eighteen.

If our people could by any means be induced to use more of this most nutritious food product, it would simplify the question of profitable dairying to quite an extent. A few New York State manufacturers have been working along the line of building up a home demand by making a small cheese especially calculated to please the American taste, and have met with a fair degree of success. This year we have had an extended drought in all the cheese producing sections, with the result that we have no surplus, and consequently much higher prices rule, but we cannot expect those conditions to continue, and if we hope to obtain good paying prices, we must make cheese that will please the consumers. This means an increase along the lines upon which the few have been working.

At the Geneva Station we have been doing quite a little work the past year, studying some of the different conditions which are met in the manufacture of cheese. In some lines we have gone far enough to make definite conclusions, in others we have not. The question of temperature in the curing of cheese is one in which we have quite definite results. In most of the buildings used for the purpose of manufacturing cheese, the question of controlling temperature in the curing room was not much thought of until quite recently, the

Canadian dairymen making the first movement in that direction. In our dairy building the curing rooms, six in number, are so arranged that the temperature can be controlled within two degrees, running each room independently. A hot air flue from below and a cold air flue from above, closed by dampers and operated by compressed air, and controlled by thermostats, enables us to study the effect of the different temperatures on the quality of cheese. The result has been very conclusive; we took several cheeses of the same make and put one in 70 degrees, one in 65 degrees, one in 60 degrees and one in 55 degrees, and had them judged at intervals by different dealers. The showing has been practically the same in all the different tests. At the State Fair, the first of September, cheese made in March, April, May, June and July, were tested by several experts, and the score gave the cheese cured in the 55 degree and 60 degree temperature almost perfect flavor, while the same dates cured in a temperature of 70 degrees the flavor was more or less affected. When we compare this with the average cheese factory curing room, which from records obtained the past season vary from 70 degrees to 90 degrees, we can only wonder that cheese cured under ordinary conditions are as good as they are. A factory was built last year, and every precaution taken to have the curing room protected from outside conditions, has proved what can be accomplished in this direction. The manager reports to me that the demand for their cheese is considerably in excess of their ability to supply, and at quite a little above market rates.

One other line of work, which is a continuation of work done in previous years at the Geneva Station, is the influence of the per cent. of fat in the milk on the yield of cheese. The work this year is a confirmation of the previous work and is also confirmed by the work of several other Experiment Stations. In the following table you see how much more cheese is made from the richer milk, showing its value in that direction, but there is another value which is of far greater importance than that shown by the table, which is the difference in regard to their desirability as food in the estimation of the consumer. The skim cheese would not be accepted at any price by a person who knew anything about cheese, if it was for their own eating. The 3 per cent. milk made a very good cheese, and if kept to six or eight months of age would be quite satisfactory, but nothing to compare with those of a higher per cent. of fat. The following table shows the results in yield from 100 pounds of milk of different degrees of richness.

	Water—Per cent.	Fat—Per cent.	Casein—Per cent.	Ash—Per cent.	Total nitrogen com- pounds—Per cent.	Pounds cheese from 100 pounds milk.
Skim milk,	90.45	0.01	2.85	0.82	3.54	.....
Whey,	93.40	trace	.....	0.57	0.86	.....
Cheese,	48.00	0.34	.....	5.00	40.70	.....
	3.36	.24	2.85	.35	.....	6.80
Normal milk, 3 per cent. fat,	88.30	3.00	2.25	0.63	2.75	.....
Whey,	93.20	0.20	.....	0.60	0.80	.....
Cheese,	37.50	32.45	.....	3.50	23.60	.....
	3.38	2.82	2.15	.32	.....	8.67
Normal milk, 4 per cent. fat,	87.25	4.00	2.62	0.77	3.30	.....
Whey,	93.25	0.20	.....	0.60	0.86	.....
Cheese,	37.50	33.75	.....	3.30	22.80	.....
	4.13	3.80	2.52	.35	.....	10.80
Normal milk 5 per cent. fat,	85.95	5.00	2.80	0.78	3.55	.....
Whey,	93.10	0.25	.....	0.65	0.91	.....
Cheese,	37.50	37.50	.....	3.30	21.45	.....
	4.73	4.73	2.70	.44	.....	12.60
Normal milk, 6 per cent. fat,	84.90	6.00	3.00	0.78	3.80	.....
Whey,	93.00	0.35	.....	0.56	0.93	.....
Cheese,	37.50	38.50	.....	3.12	19.70	.....
	5.52	5.70	2.90	.44	.....	14.60

You know that in the furnishing of raw milk containing 5 per cent. of fat, and in some cases even higher, there has been built up a very profitable business with a class of consumers who are willing to pay an extra price for something better than the ordinary. I am quite sure there is an opening for the right person in making cheese from the milk with the high per cent, of fat, for this same class of customers, but in order to do anything of the kind successfully the conditions must be right. The first thing required is a man that thoroughly understands the business; second, good, sound, clean milk; third, a curing room in which the temperature can be controlled, and last, that you must not expect to market the cheese at two or three weeks old and have them give satisfaction. If allowed to stand until the casein has become perfectly soluble and thoroughly assimilated, you have a food that cannot help but please the epicure.

In conclusion, I wish to say, that I do not believe it will be possible to carry on the business of dairying in any such haphazard way in the future as has been the rule in the past. While there are very many things that we do not know, we are so much better informed in the laws which control animal nutrition and dairy bacteriology, that the

man who makes any real permanent success in the future will be the one that has the best knowledge of those laws and conforms the closest to them.

DISCUSSION.

Professor Roberts: I would like to take a moment of your time to give my testimony in my own experience in trying to farm, and especially in trying to build up a dairy herd. My experience is that as long as I tried to purchase cows, no matter at what price, more than half of them were poor cows, and the progress was very slow. More than that, when I have purchased cows, the dairy was not uniform in character. We changed our method and used the best males we could get at a reasonable price, and have been for fifteen to twenty years building up the herd. The result is that one of the wisest and most discriminating judges of cattle has pronounced it the best selected herd of cattle in the state of New York. I think as I go through that dairy that it is the best piece of apparatus of any with which to teach agriculture in Cornell University. It is a practical lesson. We can say to any student, "go home, follow these general lines, and success awaits you."

I was struck by Mr. Smith's statement that we spend from forty to forty-five dollars a year to feed the cow. We have got to get more than 120 pounds butter fats.

I think the details on the expense of raising calves by the different speakers are worth all this convention will cost you if the lesson will be heeded, but nearly all are old men here and the probability is that we will go home and do the same old way. There is no salvation for the study of agriculture until you get that child to love these things, and they will never love them until they know something about them. The matter should be put into the hands of those who know how to apply the knowledge. I say this after the long experience we have had at Cornell University.

Mr. Austin Leonard: Eighteen years ago my father's dairy averaged 125 pounds of butter per year. Shortly after that we began raising our calves, and the average increased until last year our dairy averaged us 356 pounds of butter. This year I have kept an accurate account of all milk and butter, and found the average to be over six thousand pounds of milk apiece, with an average of six pounds of butter to the hundred. Last year the average was above six pounds to the hundred. That is what we have done by raising our calves.

WHAT HAS SCIENCE DONE TO DEVELOP THE DAIRY INDUSTRY.

BY PROF. I. P. ROBERTS, *Cornell University, Ithaca, N. Y.*

What is science? Briefly, knowledge duly arranged and referred to general truths and principles on which it is founded, and from which it is derived, a branch of learning considered as having a certain completeness. Penetrating and comprehensive information, skill, expertness and the like.

Scientific facts may be secured in a dairy barn as well as in a chemical laboratory. The testing of facts or supposed facts secured in a laboratory may be carried on by methods similar to those used in the laboratory, and when facts are secured and arranged they are scientific facts. The results secured by milking cows twice, thrice or more times daily may secure facts and hence add to science. Even more than this, the method by which the cows are milked may increase our scientific knowledge.

Scientific research has discovered the method by which the relative values of milk may be easily and quickly ascertained. This has been of great benefit not only in the past but is to be of much greater benefit in the future when all come to realize that the amount of butter fats in milk determines their relative values with a practicable degree of accuracy.

The scientist has taught us that the amount of butter fats produced by cows may be enormously increased by improved methods of feeding. He has also proven that the proportion of fat to the other solids cannot be changed only through inheritance. The clearing away of the mist which has obscured this law of milk production has been of great value since it points out the direct means and the only means by which milk containing either a high or a low per cent. of butter fats may be secured. The dairyman may now discover the profitable and unprofitable cows in the herd by methods which give assurance of scientific accuracy. He may do far more than this, for research has furnished him with knowledge by which he may so compound the animal's ration that the maximum results may be reached at minimum cost. This knowledge alone is worth more to the dairyman than can easily be computed. Intelligent effort may now be directed into those channels which give the highest rewards for the least outlay.

The scientific application of facts already well known has done

much for the advancement of the dairy industry, and has resulted in the Babcock milk testing machine and the centrifugal cream separator. But the value of the cream separator would be greatly reduced if some cheap, quick and efficient means had not been discovered whereby the residuary butter fats in the separated milk may be easily determined. These two discoveries have, in many ways, wrought marked and beneficial results in the dairy. They have made it possible to get at the facts, thereby making it possible to discover and adopt better and more scientific methods in the breeding of dairy animals.

The bacteriologist has been able to identify and classify many organisms which were formerly unknown, and which are of vital importance to the dairyman. Science has given to the dairyman the knowledge by which he may control the bacteria which are constantly tending to destroy his products. The beneficial organisms have also been discovered, and may now be utilized to improve both the quantity and quality of dairy products. Research has changed the business of dairying from one of mere blind chance, governed by witches and hot horse shoes, to a profession which may now be classed as one of the arts.

The chemist is now able to detect adulteration in cattle foods with such certainty that laws governing the sale of them may be certainly and intelligently executed, for it is now as easy to detect adulterated foods as it is to detect adulterated alcohol. But few of the laws enacted to protect the dairy interests could be executed if modern science had not come to our aid.

Science has left her cloisters and gone to the field for material for her crucible and retort. Nature with her complex and numberless modes of action offers rich and abundant material for research. If we look over the literature of agriculture, which has grown to enormous proportions during the last quarter of the century, it is seen that science has been steadily at work solving many of the mysteries of the soil. So many useful and interesting things have been discovered relating to dairy husbandry that even a bear mention of them cannot be made here. A few of the discoveries, however, are so far reaching and helpful that they cannot be passed over. But for the researches of the scientist how could we know that the soil contains vast stores of potential plant food, or that the plant food in most soils is lazy, or that the soil frequently furnishes but a scanty and unbalanced ration for the plants which grow upon it.

The chemist has joined hands with the farmer; the one with retort and balance has discovered the kinds and amounts of plant food in the soil, while the other with plow and plant has determined the availability of the plant food. In some cases the farmer is in advance of the chemist. By research he has discovered that a con-

tinuous and full supply of moisture in the soil is as necessary, even more necessary, than plant food itself, if full use of the nourishment which the land contains is secured. The chemist and biologist have discovered many valuable truths in regard to the action of lime, but the farmer has also discovered many facts governing its application and economic use.

Who but the farmer discovered the wonderfully beneficial effects of clover crops, what to sow, when, where and how to plant? The botanist, the biologist and the chemist have discovered many of the laws which govern the growth of plants; the farmer by his researches in the field has revealed how, when and where these laws affect productivity. Science in the early days too often kept a one-horse hobby in the laboratory. She now drives a fast four-in-hand through all the land.

The dairyman has experimented with silage until he knows its value and the best methods of storing it, while the biologist and the chemist have lagged behind him. The mysteries which a modern silo contains are as yet too complex for them.

I have now to speak briefly of the intellectual stimulus which modern research and invention has given to the world. Until recently those engaged in dairy husbandry were still carrying on their business by methods in vogue at the beginning of the century. Steam, electricity, the self binder and the mowing machine alleviated the toil of the mechanic and the general farmer long before research and invention came to the aid of the dairyman, but now scientific research in shop, in field and laboratory has come to the aid of the dairy industry.

The subject so far has been treated from the utilitarian, the financial standpoint, but there is a broader, a better and more far-reaching standpoint from which to view it. A close observer of men and things once remarked that those engaged in fruit growing were the most intelligent and those engaged in dairy husbandry the least intelligent of the farming community. This may have been true once, I trust it is so no longer.

Let us see what penetrating knowledge, comprehensive information, skill and expertness have done to develop the dairy industry. First, it has taught many farmers to think, inspect and compare. It has served as a potent, intellectual stimulant, especially to those engaged in dairy husbandry. Had science done nothing else than this it would be a full compensation for the cost and labor of securing and classifying the mass of facts related to dairy husbandry. The late Honorable George Geddes once said that the intellectual uplift given to the farmer by reason of improved agricultural machinery was a full equivalent for the cost of all the improved machinery

which had been built. What then must be the intellectual value to the dairyman of the knowledge reached by modern research? If the definition of science, previously quoted from distinguished authority, is correct, then some credit should be given for the skill and expertness which the scientific farmer has promoted among the dairymen.

But for the beneficence of the federal and State governments the dairymen would still be underlings. What is this uplift worth? I mean the intelligent uplift. Far more in my opinion than it has cost and far more than the financial benefits which have been secured. As long as mind dominates matter the intellectual results of science will be more valuable and precious than the economical and financial. A fact may be valuable. How to use fact is invaluable. To secure new facts and to acquire skill, to apply them logically, much time and money are usually necessary. Therefore, the Commonwealth should deal liberally by the institutions engaged in education and research along industrial lines. A tax of one cent per capita in this State would produce \$60,000, which might well be added to the sums already spent for the promotion of agricultural knowledge. Can the Keystone State afford to permit her educational institutions devoted to the advancement of the industries to languish for want of full sympathy and liberal support? Can we afford to go back to old methods or even to stand still?

Finally, let me present to you some figures which set forth most graphically what science in work shop, field and laboratory has done for the dairyman and the grain grower. Mr. H. W. Quaintance, of Champaign, Illinois, has made a most extensive study of the days labor required to produce the leading farm crops, corn, wheat, oats, rye, barley, potatoes and hay, of the United States by the old or hand method and by the machine method. He finds that 81.5 per cent. of the days work formerly required is saved by the use of modern machinery. By the kindness of Mr. Quaintance I have been allowed to use the final results. He will, in the near future, publish extended tables which will give the saving of days labor by the new over the old method. These tables will be very valuable, and they lead to the conclusion that the reason the per cent. of the population engaged in farming is steadily decreasing is that a given unit of product can be produced for nearly one-fifth as many days labor in the field as it could formerly.

REQUIREMENTS OF AN UP-TO-DATE BUTTER MAKER.

BY GEORGE C. CORNELL.

It is a very great pleasure to me that I have been permitted to meet here with you in grand old Chester county, the father (so to speak) of the dairy industry in the old Keystone State, and listen to the very able papers and addresses that have preceded me.

It is no use for me to take time telling you, that I am no orator, no public speaker, and the like, for if you are not already acquainted with this fact, you will be before I am done with this subject. Let me say that I am just a common, every-day butter maker, nothing more; and only out of courtesy to our secretary (who requested me to talk along this line), and from a desire on my part to be of any service I consistently can to the Union, have I consented to address you. I have no paper prepared for this occasion, neither have I an elaborate speech prepared. I will just talk to you, as the good old Quakers say, "as the spirit moves."

Before proceeding to the requirements of this up-to-date butter maker, let us consider for a few moments the material that will be required, out of which we must make this butter maker. First, he must be physically strong and robust, as the requirements of a butter maker are such that none but those who are strong, and well-developed physically should enter the profession. Second, he must be intellectual in the highest degree. It has been said in the past, when a man or boy was rather below the average in intelligence, "well, we will make a farmer of him." Now don't do this; neither would I try to make a butter maker of such a man or boy. We want the very best material both for farmer and butter makers.

The up-to-date butter maker must have the qualities of a successful business man. Strength, with good health, intelligence, industrious, honest, persevering, thorough and systematic in his work. In fact, he must represent the highest type of manhood, physically, intellectually, socially and morally. He will be temperate in all things, and especially so in the use of intoxicating liquors; these he will abstain from altogether. He will also abstain from the use of tobacco, not only because it is a useless and filthy habit, but because it will impair the sense of taste and smell, which are so essential to the success of the up-to-date butter maker. These are a part of his

stock in trade, a part of his capital, which will bring him good returns if cultivated instead of deadened. He will also abstain from the use of profane and vulgar language, for various reasons. Its use always lowers his position socially and morally. Then again if he indulges in such language, he must not only allow, but expect his patrons and associates to do the same; and I can assure you that when the butter maker and patrons both get to using profane language, especially both at the same time and same place, namely, at the weigh can, the creamery is a back number, or will be soon.

Having found what is required, the question comes up, where can we obtain all this? I answer in the homes of these farmers and dairymen now before me. Right here in Chester county, away up in Bradford county, in fact in all the counties of this grand old State, such material can be found on the farms. The very best material for perfect manhood and business qualities have come from the farms in the past; it comes from the farms in the present; and it will come from the farms in the future.

Now, having found the boy or man, as the case may be, with the qualifications necessary for this very important position, let us look to his education. He will be required to be highly educated, in the direction of course in which his profession requires. We now assume that the object of our selection has arrived at the age of say sixteen to twenty-one years, and has had the advantages of the best schools with which his surroundings are provided, and that he has made the best of these privileges. We now send him to our State College, not simply for the creamery or dairy course and the short course at that, but for a full course in creamery and dairy study; also the agricultural course as well.

The requirements later on will be such that all this education will be practical. His patrons will not only want to know how to produce more and better milk, care for the same, etc., etc., but he must be able to enlighten them as to the growing of forage crops, compounding rations, also on silos and silage, fertilizers, and many other things that will come in his line. There is no danger of too much education for one who possesses the requirements we have previously named. Such a one will put all the education possible to good use.

We now find the subject of this talk ready for the battles of life. We find him next in charge of a creamery. My remarks now will be particularly applicable to the co-operative creamery butter maker, as this is the creamery I am most familiar with; although in general my talk can be applied to any kind of management. We assume that at about this time in the drama of life, our young butter maker takes the most important step in all his life. He gets married. We assume this because we know that his success as a butter maker de-

pends largely upon this step. Of course he will be required to use the same care and caution in his selection of a helper that we have used in selecting our butter maker, but he will need this helper. It needs a woman's eye to tell us just when the windows need washing, and when the cob-webs need sweeping down, etc., etc. She will probably see that these things are all done, just before they really need it. All the above being realized, we now have the picture of the butter maker in his home. This home will usually be a few inconvenient rooms in the second story of the creamery, or worse still, a cheap tenement house at some inconvenient point from the creamery, and the joys of the butter maker's life have now really commenced. He will be required to accept these inconveniences without murmuring.

We now start in Monday morning for the day run. We find our butter maker up at three o'clock in the morning. He first starts his fire under the boiler; he will be required to look to the water in the boiler before starting the fire, instead of one-half hour, or an hour later (provided he and the plant are there), as some butter makers have done. Next he will examine his cream in the vat, ascertaining the temperature, also the degree of ripeness.

He will be required to take the temperature (not as our mother did by touching the forehead) but with an accurate thermometer, and then read it accurately. He will be required to test the acidity of his cream; not simply by taste and appearance, but by some reliable acid test.

We again assume that he finds both temperature and acidity as they should be from best results. If they are not, he is off. The up-to-date butter maker will be required to set his cream to such a degree of perfection the night before that (barring sudden changes in temperature, or like unavoidable conditions) his cream will be right to churn at a given time next morning. Having found his cream ready for churning, he prepares the churn and runs the cream into it. He now takes the coloring, not by throwing in what he guesses is right in the hap-hazard way, but he is required to color by some fixed rule, so that each churning shall be absolutely alike. If necessary a part of two churnings can be placed in one tub and no difference in shade of color observed. The churning is now put up, and we find the steam raising. He next carefully oils the engine and all machinery needing it, and by this time there being sufficient steam to run the churn, he starts up. It is now four o'clock.

He will be required to churn at a temperature that will bring the butter in about three-quarters of an hour. While this is in progress, he will get his packages ready, steaming and soaking tubs, preparing tub linings, washing the vats and utensils, etc., etc. He will be re-

quired to keep busy. This is one of the pays of a butter maker's life. He is never obliged to sit down and wait. By the time all these little odd jobs are done, the churning will need his care. It must be stopped at the proper time, butter properly washed with water at a proper temperature. It must also be properly salted, not by guess, but the requirements demand that it shall be salted, as colored, by some regular method that will give the same results day in and day out.

The working will also require much care and skill. It must be worked enough, it must not be worked too much; this up-to-date butter maker must know just when to stop the worker. The same care and painstaking will be required in putting up for the market, either packing or printing.

There is a right and a wrong way, and our up-to-date butter maker will do it the right way. It is now six o'clock A. M., having taken one hour to get started, and about two hours to churn, and care for the butter, and put it up ready for shipment, he now steals the time for breakfast if possible, but lucky is the butter maker that doesn't go without breakfast many a day in the busy season.

The conditions will require this, and he will be required to accept the conditions without complaint. He now starts his separator, and by the time speed is up there is a patron at the door. Now comes in the greatest requirements of all; that of successfully dealing with all this great variety of human nature, in all the different stages of intellectual and educational developments. This up-to-date butter maker will be required to do this, and when he can successfully manage, then he is entitled to a seat in Washington, D. C., among our great statesmen, or a position as prime minister to some foreign country; for he will have shown himself as great a diplomat as have any of these great men.

The correct sampling, weighing, testing, and many other items too numerous to discuss now, are some of the requirements of the modern butter maker. We must pass them by—I have already spoken too long. One thing, however, I must mention, and that is the testing of skim milk and buttermilk. The up-to-date butter maker will be required to know the per cent. of fat left in both (no guess work) not only once in a while, but all the time. A composite sample should be kept and tested regularly when the other testing is done. The skimming now done, he must proceed at once to care for his cream, and prepare for the proper condition for next morning. He must clean up thoroughly; and I want to say right here that this up-to-date butter maker will be required to use more live steam and hot water than is used by many. If in a co-operative creamery he will be required to mark up and ship this butter. He is required to

look up a market and sell this butter and get the best prices; no up-to-date butter maker in Pennsylvania should sell butter on commission. The western States should supply this trade. Our State consumes more than we make, and the butter maker will be required to get a home market for his butter, at a much better price than the commission man can give him.

He must be a good collector, as well as a good salesman; he must be a competent book-keeper, and a successful man in earing for the correspondence of the creamery, as much of his success in selling will depend on this. As he cannot see his customers face to face, he must draw them to him by his correspondence.

The up-to-date butter maker will be required to buy many, or perhaps all the supplies. He must be a judicious and close buyer; he must study the market both for buying and selling; in fact he must be a constant reader, when not at work, and a constant thinker while at work.

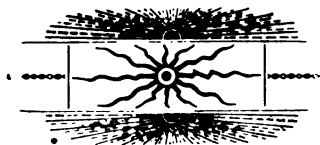
There are many things to commend as well as to discourage those thinking of becoming butter makers; but I think the one thing most to be condemned is the practice of running Sundays or seven days a week. I am well aware that this cannot be avoided by the creamery until the patrons are educated against it. I hope and trust that in the near future some method may be adopted that will do away with Sunday work in the creamery. The butter maker should have at least one day in seven free from the cares of the creamery.

In closing, let me say that in return for all the requirements I have named, this up-to-date butter maker will receive from \$400.00 to \$800.00 per year; and nearly all patrons and employers, especially employers in co-operative creameries will say that he is over-paid, he receives more than his just dues from the business.

Ladies and gentlemen, I leave it for you to decide if such is the case.

DEPARTMENT OF AGRICULTURE,
DIVISION OF FARMERS' INSTITUTES.

**PAPERS READ AT FARMERS' INSTITUTES DURING THE
SEASON OF 1898-9.**



PAPERS READ AT FARMERS' INSTITUTES DURING THE SEASON OF 1898-9.

THE LAWS OF TRESPASS, AS THEY RELATE TO AGRICULTURE.

BY HON. GEO. W. HOOD, *Indiana, Pa.* Read at Farmers' Institute, Jacksonville, January, 19, 1899.

Trespass, in its largest and most extensive sense, signifies any transgression or offense against the law of nature, of society, or of the country in which we live, whether it relates to a man's person or his property. But in the limited and confined sense in which we are, at present, to consider it, it signifies no more than an entry on another man's ground, without a lawful authority, and in doing some damage, however inconsiderable, to his real property.

For the right of property once established in lands, it follows, as a necessary consequence, that his right must be exclusive, that is, the owner must have to himself, the sole use and occupation of his soil. Every entry, therefore, thereon, without the owner's leave, and especially, if contrary to his express order, is a trespass or transgression. The Roman laws seems to have made a direct prohibition necessary, in order to constitute this injury. But the laws of England, justly considering that much inconvenience may happen to the owner before he has an opportunity to forbid the entry, has treated every entry upon another's land as an injury or wrong, for satisfaction of which an action of trespass will lie; but defense was wilful or inadvertent, and by estimating the actual damage sustained. And the same may be said to be the law with us to-day. That every entry upon land, in the occupation or possession of another, constitutes trespass, unless the act can be justified in the exercise of some legal or personal authority, or incorporated right. If your land is not surrounded by an actual fence, the law encloses it with an imaginary enclosure, to pass which is to break and enter your close, and every trespass upon land is, in legal parlance, an injury to the land, although it consists merely in the act of walking over it, and no damage is done to the soil or grass.

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The mere act of breaking through the imaginary boundary constitutes an action of trespass, and is in violation of the right of property, though no actual damage be done, and where a person has a special privilege or authority to enter upon lands, to make seizure of goods, and he exceeds his authority, by breaking open the outer doors of your dwelling house, he is a trespasser *ab initio*, and all his subsequent acts are trespasses, and his position is then the same as that of any stranger, acting without any color of authority or justification whatever. The same is true of a person who has lawful authority to enter lands for any purpose whatever, if he exceeds his authority by doing what he ought not to do, or what he had no authority to do, or if he stay longer than he had any right to stay. If one man throws stones or rubbish, or materials of any kind, on the lands of another, he is a trespasser, and will be held responsible for the act. To pour water, out of a pail, into another man's yard, or to fix a spout so as to discharge water upon another's land, or to suffer filth to ooze through a boundary wall, and to run over another's close or yard, without his leave or permission, is a trespass, unless a right of way over the adjoining close, or a right to discharge water upon it, or a right for the passage of waste water and refuse through it has been gained. There is a distinction, however, between a direct forcible act of trespass and one which is merely consequential.

If I erect a spout on my house so that the water turned into it from my premises falls directly upon the land of my neighbor, this is a trespass; but if I erect the spout so that the water falls first upon my own land, and then escapes on to the land of my neighbor, but after the water falls from the spout it runs upon his land, I cannot be accountable to him in an action of trespass.

If I build my house with the eaves projecting over the land of my neighbor, so that when the rain comes, it falls upon his land, trespass in this instance will not lie against me therefore, for although I built my house with the eaves projecting over on to the land of my neighbor, yet I did not cause the rain to fall, nor did it fall under my direction or control. The injury is not direct from the act, but in consequence of it, and a result thereof, and for such injuries the law has provided an action on the case, but not trespass as the remedy, (39 N. Y., 400; 6 Cush. (Mass.) 70.)

But while there are many instances in which it has been held that mere trivial acts, such as the firing of a gun loaded with shot into a field, or the passing through the air in a balloon over the land of another, breaks the close, and thereby constitutes a trespass, yet these are instances in which actual damage can rarely happen, and of which the law, owing to its desire to be just to all, pays but little or no attention to, and hence we pass from this to that which is more common, and which is most important to consider, viz:

TRESPASS BY CATTLE AND DOMESTIC ANIMALS.

If my cattle, sheep or any animals in which the law gives me a valuable property, trespass upon your land, I am responsible for the trespass and consequential damages, unless I can show that you were bound to fence your land and had failed to do it. And it does not matter whether my animals be in my own immediate care, or in charge of a servant, or in custody of some stranger, I am alike responsible for any damage they may do. But if my servant, without my knowledge, takes my cattle, and puts them in another man's land, my servant is the trespasser, and not I, for his willful dealing with the beasts without my authority gains a special property in them for the time, and for this purpose they become his beasts.

But if a wife thus deals with her husband's cattle, the husband himself is a trespasser, because the wife can gain no special property in them against her husband. By the common law, a man who turns his beasts upon the commons or into an unenclosed lot of ground is bound, at his peril, to see that his beasts do not stray or trespass upon another's land; and when a man is bound by contract or prescription to repair a fence between him and another's farm, and he neglects to do it, and the beasts of another get on his land, this would be a good justification for an action of trespass brought by him. In such a case, it is lawful for me to go on to my neighbor's land after my beasts, and drive them back on to my own land, and this would be a good plea in justification of the trespass, because it was made necessary on account of the default of my neighbor.

If I drive my cattle along the highway, and you have an open, unenclosed land adjoining the highway, and my beasts enter your land, and eat the herbage thereof, and I come immediately and chase them off, you can have no action against me, because the chasing was lawful. So if my goods have been taken by you and placed on your land, I may justify my entry on your land for the purpose of re-taking them. Where two persons have adjoining fields, and no hedge or fence between them, each must take care that his beasts do not trespass upon his neighbor, unless one of them has acquired a right or title by grant or prescription to have the boundary fence between his close and that of the adjoining proprietor maintained and repaired at the expense of the adjoining land owner. Every man must use his own land so as not to injure another, and as of common right and by common law one is bound not to let his cattle trespass on the lands of another, so he is bound to use those things which are his in such a way as not to hurt another by their use.

If a land owner, who has land bordering on a highway, neglects to fence the land, and a drove of cattle passing along the road gets into his fields, and thereby injures his crops, he must either drive them

out himself or give reasonable time to those in charge to get them out. But whilst the common law required the owner to keep his cattle within his close, and their intrusion on another's possessions was a trespass, yet it was provided by statute, in 1700, that the owner of improved land must fence them, both to restrain his cattle and shut out the roving cattle of his neighbor, and unless improved lands are inclosed by a fence, the owner is in default, and cannot maintain trespass for damages by roving cattle (55 Penn'a, 227), and when it is the duty of the land-owner to fence his land, he cannot recover compensation for damage done it by stray cattle, so long as his duty is neglected. (Ibid.)

Another way in which farmers are trespassed upon, is by rabbits and pigeons, and against them the law has provided no remedy. If my neighbor encourages the growth of wild rabbits, and forms burrows for them upon his land, and the rabbits stray from his land to mine, this is no trespass for which the breeder of the rabbits could be held responsible, for when they have left his land they are not then his rabbits doing damage. Being animals "*ferra naturae*," he has no more property in them after they have left his soil, than the birds of the air, which may breed on one man's land, and destroy the crops of another. The only remedy for those whose crops are destroyed is, in the destruction of the rabbits. Rabbits running at large, on a common, may be killed by any one who desires their destruction, and the same law prevails with regard to pigeons. If they come upon my land, I may kill them, but I have no remedy against any one for breeding them. Dogs, too, often do damage by intruding or trespassing on your valuable property, and by the common law a man is not considered to have the same valuable property in a dog as in horses and cattle, and it has been held that if a man's dog goes to his neighbor's garden and injures his crop, no action will lie, unless the dog is of a peculiarly mischievous disposition, so as to be unfit to be at large, and this, too, known to his master. If the master accompanies the dog, he is a trespasser himself, and the damage done by the dog is consequential upon the trespass by the master. Owners of dogs in Scotland have recently been made liable for injuries done to sheep and cattle by their dogs, and all persons who harbor dogs on their farms are deemed to be the owners of the dogs, unless they can prove the contrary, and do show that the dog remains on their premises without their knowledge.

In Pennsylvania, it is provided by statuté, that trespass will lie against owners of dogs for injuries committed by them to sheep, (7 Barr, 254), and it is lawful for any person or persons to shoot or kill any dog or known to be chasing or worrying sheep, or accustomed to do so, within this Commonwealth, without liability on the part of

such person or persons to pay any damages therefor; and the owner of such dogs is liable for all damage done, or caused to be done, by every such dog or dogs. And to justify the killing of a dog under this act, it is not necessary that he should have been actually worrying the sheep. It is enough that he has been observed to actually follow them with hostile intent, and that the owner knew of his propensity. (7 Harris, 359.) It has also been held that one may lawfully kill a dog found trespassing on his grounds, and within his enclosure, if he cannot otherwise protect his property from its depredations. (6 Penn'a, 318.) The owner of a vicious dog is bound to confine it, (27, Penn'a, 331;) and it is lawful to kill a dog by which one has been bitten, whether mad or not. (Add. 215.) Where the dogs of several owners kill and worry sheep, each of them is responsible for the whole damage in a joint action. (63, Penn'a, 341.) But in the State of New York, where two dogs of different sizes were found killing sheep, in the absence of direct proof, it was recently held that the jury were justified in finding that the larger dog killed the more. And where a flock of sheep is injured by fright the defendant is likewise liable for the injuries caused by the fright. (63 Penn'a, 341.) But to close the subject as to dogs, it must not be understood, by any means, that whilst you can lawfully shoot or kill a dog in the act of worrying sheep, you can therefore poison him, because that remedy is not to be resorted to under any circumstances. Poison is not to be thrown even to dogs, and the mere exposing of any poison for that purpose, whether the dog touches it or not, is in violation of the laws of this Commonwealth. Let farmers protect themselves as best they can against dogs, but they should never resort to the secret and dangerous remedy of poisoning them. We have many instances in our State where valuable animals have partaken of the poison placed for the dogs, and considerable loss of property the result of this dangerous practice.

Another of the most annoying forms of trespass to the farmer, and the last one I shall mention, is that of hunting and fishing. It seems that many persons suppose that, by force of some general custom, they have a right to hunt and fish over another's ground as they please, but this is a great mistake. How often it happens to the farmer, as he goes out to harvest his field of wheat, to find much of it trodden down and entirely destroyed by hunters and hunters' dogs passing through it and over it. How often they tear down his fences, open his gates, and leave down his bars, whereby his cattle escape to the highway, and become trespassers, perhaps, on the lands of his neighbor. Some suppose that because squirrels and rabbits and pigeons are not property, they have a right to pursue them anywhere, no matter whose possessions they trespass upon. At one time, it was

held in England, that it was lawful to follow a fox with horses and hounds over another's grounds, if no more damage be done than is necessary for the destruction of the animal by such pursuit; but, in the year 1809, a different doctrine was laid down, by Lord Ellenborough, who said: "These pleasures are to be taken only when there is the consent of those who are likely to be injured by them, but they must be necessarily subservient to the consent of the others. There may be such a public nuisance by a noxious animal as may justify the running of him to the earth, but then you cannot justify the digging for him afterward. That has been ascertained and settled to be the law, but even if an animal may be pursued with dogs, it does not follow that fifty or sixty people have therefore, a right to follow the dogs, and trespass on other people's lands." "Circular fox hunts," which but a few years ago were very frequent in some parts of Pennsylvania, are all in violation of this law, and are only sustained and sanctioned by the people over whose land the hunters pass, by a tacit and general consent.

When a man has an inclosed wood lot, which he has made inviting for wild game to come and take up their abode, no man has a right to enter there and destroy or kill any of his game without the owner's consent. A man would, in this instance, be as much of a trespasser as if he trampled down a portion of the growing grass or grain.

AS TO FISHING.

In all ordinary streams or ponds, the right belongs solely to those persons owning the adjoining land. If the stream is navigable, the public have a right to boat up and down it, and fish from their boat, but have no right to go on shore and do it. In some States the law is, when a man has a right of fishing and fowling therein, and may pass and repass on foot through any man's property for that end, so they trespass not on any man's corn or meadow. But in Pennsylvania, we understand, the law to be quite different. A pond on a man's farm, no matter its size, belong to the owner of the farm alone, and any passing to and from the pond, without permission of the owner of the farm, would be trespass. The Susquehanna and other fresh water rivers of the State in which the tide does not flow, do not belong to the owners of the bank, and no person has the exclusive right of property therein, (14 S., and R. 71); (61, Penn'a, 21). The concessions of 1681 are confined to the first purchasers, and persons claiming under them. (Ibid.) Independently of the acts, 8th of February, 1804, and 23d of February, 1809, a riparian owner has no exclusive right of fishery opposite his shore in any navigable river (61, Penn'a, 211). He has the exclusive right only when the river is not navigable, and when not exempted by the concession of 1681.

I have thus imperfectly touched upon some of the legal rights and duties of farmers, leaving many parts of my subject without a mention. Had time permitted, I should have been glad to say a word about the many impositions practiced by evil designing men upon our farmers, in the sale of seeds, improved lightning rods, "patent pitch forks," and the like; but we trust that in the present age of enlightenment of the world, no farmer will allow himself to get into the hands of accomplished villians, for any purpose whatever; and, in conclusion, if I have been able to impart any valuable information, and save any farmer from the many entanglements of the law, I shall feel that my purpose has been fully accomplished.

THE RELATION OF EDUCATION TO OUR FARMERS; IN THE PAST, PRESENT AND FUTURE.

BY DAVID WYANT, *Principal Beaumont High School, Beaumont, Wyoming Co., Pa., Read at Farmers' Institute, Tunkhannock, February, 1899.*

In early years, whether the farmer was educated or not, made very little difference, as he raised his own food, manufactured his own clothing, and other few articles needed in the early home. Each farm was a little world by itself; the failure of some crop in a foreign country made no difference to him, as he was sure of having plenty of food; the rising in the price of clothing at the city market, made no difference to him, for he raised sheep for their wool, and sowed flax, making sure that his family could be clothed.

Learning was considered as a luxury, the classes only, in place of the masses, were educated. The teachers were, therefore, not generally prepared for their work, making it necessary for them to govern by brute force, using such methods as follows: Standing pupils on sharp buckwheat grains, standing them on the stove, and many other cruel ways. Their salary was very low, as the following illustrates: "The young men from the New England States would come out in the fall, bringing with them a spelling book and a halter; and after teaching all winter would steal a horse and ride back to their home," as was told by our forefathers. That was the only way that they could keep even.

For the first century following the landing of the Pilgrims, there was not a lawyer in our country. The minister acted in capacity of a lawyer. In early years, the university was only for a select few; but

the American development has brought it home to our people. To-day there are nearly four hundred colleges in our country, their number showing plainly that our young people from the farms and workshops are to have a higher education. Each one of our States has provided for a State College to furnish free tuition for the young people of its respective Commonwealth.

Our young people have a choice of over twenty courses at our State College. Also there is offered at our college a course which anyone can take while at their own home, if they have time enough to do the proper reading. The short course given through the winter weeks in dairying is proving of great benefit to our young farmers, and has helped some of our young men from our county this winter.

PRESENT FARMING.

No one pretends that farmers are making money rapidly. They have good homes in nearly every case, plenty of good, wholesome food, and decent clothes. They are not under the eye of the taskmaster. They are sure of work. The man who looks upon his farm as a machine from which dollars only are to be made, and does not value any other of the numberless blessings it gives him will never cease to talk about hard times. It is not alone for the money it produces that the farm should be prized; but because it brings men and women near to Nature's heart, and their children grow up strong and stalwart, ready to meet the trials of life with bodies strong enough to perform every task.

By actual counting, in one of our large cities, it was learned that eighty per cent. of our business and professional men were raised on the farm; making it a plain fact that the future success of our great nation depends upon the training that will be given in our country schools.

FUTURE PROSPECTS IN EDUCATION.

At this time, in our own State, the leaders are in hearty sympathy with the pupils of our country schools, making it the time for us to make our most strenuous efforts. State Superintendent Schaeffer has been trying to secure the same school privileges for our country children as are given in the larger towns and cities.

Ex-Governor Hastings received his early education in a small country schoolhouse, and Governor Stone had an experience in securing his education that will keep him ever mindful of the young men who are now toiling for an education. An example of what one person can do for his fellow people is given by the life of the great colored educator, Booker T. Washington, who has helped thousands of his colored people. The Tuskegee Industrial and Normal School under

the care of the great educator, is sending out from its walls in Alabama, many young people prepared to teach the negroes. Under his care farmers' institutes are being held, and he is rapidly solving the negro problem. It has recently been shown that within the last few years a surpassingly large number of college graduates returned home to take charge of the old farms, and use their knowledge to make them pay better; and in nearly every case, the efforts have met with gratifying results.

NEWSPAPERS ARE A GREAT HELP TO FARMERS.

Every morning mail brings the fresh news from all over the world. There is no use of the farmers not knowing the prices of goods and products in the world's markets; they have saved enough on the sale of one beef to pay for their daily papers for one whole year, by reading and keeping on track of the markets. To-day the farmers buy nearly everything they wear and half of what they eat; and sell nearly everything they raise. They are all around men, doing all kinds of business with the leading men of the world, of whom the farmers form a large proportion. They are educating their sons and daughters at the colleges, giving them a liberal education along with their strong bodies developed on the farm.

But with all this great movement, the rural schools have not in every community kept pace. In some places we find the stables and pig pens finer buildings than the school houses, where our boys and girls are to spend many hours of their life through the most impressive period of their lives. The tendency in our country schools has been to send our young people to the city, where many have become very important factors; while many have been ruined by the temptations which do not exist in country life. The bill passed providing for Township High Schools and for free transportation, will be a great help to the young people of the country homes.

The tendency in our rural districts is to revolutionize all this by securing teachers who know the value and beauty of a country home. They will teach the pupils to see more than toil and drudgery. And our school directors are seeing that a great influence can be brought about to help the country home by putting readers into our schools that give information concerning the plants, insects, stones, and all of nature's works. Several publishing companies are doing a splendid work publishing readers which give useful information on thoughts, which help to open the eyes of the young to nature's beauty.

Quite often we hear our teachers say that we have no chance to have good schools in the country; and I know that our people have to walk long distances and encounter all kinds of hardships, but

those are the exercises that help to develop noble men and women. We have nearly all of the practical advantages on our side. Growing plants, flying and creeping insects, all are to be found; springs, brooks, creeks, rivers, and hills, mountains and valleys are before us on every side. I am acquainted with a teacher, who, when he first began teaching, tried to have each young man in his school to become book-keepers or clerks; but, to-day, after he has taken a liberal course in the college curriculum, he is trying to get the young men of his school interested in the farms.

Many of our present teachers have not been led to see all of this beauty in God's great works, but they now by the aid of their educational books and magazines are having the thoughts presented to them in such a way as to receive their utmost attention. The statement has often been made that the country boy of twelve has more real knowledge of botany than the high school graduate from the city. He has a practical and real knowledge by being in contact with the living things. If our young men have their attention brought to the phenomena of the soils, and are led to make use of the world's markets, the young men will go out of school having in mind the best crop for the market. What can we teach that is of greater benefit to our boys and girls than the exactness, truthfulness, greatness, simplicity, and beauty of God's works, with which we are continually living. Your speaker has plowed many flowers deep under the ground, not realizing that the greatest care had been given to their arrangement in forms and composition.

All teachers are beginning to realize that more studying of real things of practical value should be taught. One of the greatest text books for the future teacher will be the rocks, plants, and living animals. He will be a part of the community in which he lives, and will be judged as a successful teacher by his pupils' love and capacity for work. Such a power of teaching will give the teacher a high market value. Directors are hungering after just such teachers, and will, in the future, respond with liberal compensation. Being acquainted in a community not many miles away, where such an awakening has been brought about by such teachers, it seems plain that it mostly depends upon us as teachers.

TIMES ARE DEMANDING BETTER PREPARATION IN EVERY LINE OF WORK.

The members of any church wish the best educated pastor, the patients wish to employ the very best physicians, the patrons wish the best educated teachers; and the great inventions that have been made in machinery, and electricity, which is still in its infancy, places more forcibly before the farmer the necessity of a fair education.

Manual labor, to-day, does not count for as much as well directed, intelligent mental effort put back of manual labor in the farm direction. The farmer, lumberman, or any other business man, if he has the choice between two men, and their qualifications are equal, excepting their education, will take the educated man every time. Electricity with its great machinery, and steam power, has put our farms in close touch with the city advantages and business centers. Probably not many years will pass until we will be utilizing the power going to waste in our creeks and rivers, running large dynamos, and conveying the electricity to the neighboring farms, where the power will be utilized to run the threshing machine, fodder cutter, wood saw, and especially the grindstone, which has been so great a factor in sending the boys from the farms.

If any person twenty years ago would have told us what was to be done with electricity to-day, we would have thought that insanity was leading them downward; but the next twenty years will also see wonderful improvements in the science. Our newspapers are a great help in the education of our people. They help us to keep up with the knowledge of inventions and other improvements. This age in literature should be called the "newspaper age."

We have in our schools the current news, giving all of the important happenings of the world, furnishing us the history as it is being made throughout the world. We have very plainly seen recently what education does in war. In the China-Japanese war, it was the education that conquered; in our recent war, where the warships were of an equal number, the same number of men, the same sized guns, and everything equal except the education, which was in our favor. What was the result? Education won. Our men were practically educated.

The man who is not educated is not able to run the great machines used in the great wheat-growing plains; the reaper that cuts and threshes the grain at the same time, the gang plows and the monster steam threshers. The inventors have made wonderful machines. The farmer can now while riding under a shade, cut his hay, reap his grain, plow, harrow, sow, and cultivate. The farmer, if he wishes to make any money, must know something about the different breeds, the markets and the demands of the people. Beecher said that he invested ten dollars in a hog, and fed it twelve dollars worth of corn, and sold the hog for fourteen dollars. He said that he gained on the hog, but he lost on the corn. Many farmers are raising stock and selling it for less money than it cost them, while many are so managing their business that they receive a fine profit.

The Department of Agriculture is doing a grand work for our farmers by promoting the development of agriculture, horticulture,

forestry, and publishing statistics relating to agriculture. The subject of forestry is receiving much thought in the past years. What does it mean to us to know that one-nineteenth of our grand old State was sold for its taxes in 1895; over two and one-half thousand square miles. The timber has been utilized, or destroyed by fire to such an extent, that thousands and thousands of acres along our streams, which ought to be timbered are desolate. Farmers, who live along the streams, have long ago realized the great damage of floods; and we are all seeing the effects of the droughts nearly every summer.

The fertility of a country may be destroyed by stripping it of its trees, which seem to very greatly effect the amount of rain that falls. In some parts of India the trees have been cut away, the wells have sunk, the rainfalls has ceased, and the country threatens to become a wilderness. Numidia, the Plains of Babylon, and Judea, are instances of countries once proverbially fertile, and now barren.

Very useful information on the evil effects of the destruction of our forests, insects which are our enemies, are printed each year and distributed throughout our country by the Department of Agriculture.

We are using the holiday "Arbor Day," in which we may inculcate the love for trees, and impart knowledge that will be of a practical benefit to our nation. A law has recently been passed providing that constables shall, with the help of deputized persons, extinguish forest fires. Our people begin to see the benefit of our governments controlling the tracts of land lying along the heads of our streams.

When the forests were heavily timbered, the leaves formed a great spongy substance, which tended to hold the water back and let it go down gradually through the summer. Since the forests are destroyed, after a rain, the water comes down with a rush, as some of our freshets have shown us; and also in the spring, the hills not being shaded, the snow melts rapidly and often does great damage.

Education is proving to be a great help to our stock raisers, as statistics show that 14,437 animals were tested with tuberculin in our own State the last year, and 1,348 animals condemned as tuberculous, and settled for by our State. By this method, our people may rest assured that the dreaded disease, consumption, will be made less prevalent. Our State publishes in the Agricultural Reports all information found on any subject that will help our people. In England, an association for the prevention of consumption and other forms of tuberculosis has been formed. Its endeavor will be to instruct the public by means of circulars and lectures.

Many of our farmers are continually hauling their hay and fodder away from their farms. Let us see what natural elements are taken away from the farm in fourteen tons of corn fodder. Two

casks of potash, 2 of lime, 1 of soda, 1 carboy of vitriol and 1 demijohn of phosphoric acid.

Our future farmer will not buy any fertilizer until he examines the soil of the poor field and learns what elements have been robbed from it. Then he will buy the elements needed.

AGRICULTURAL EDUCATION, WHAT AND WHY.

BY FLOYD S. LEACH, *Chinchilla, Pa., Read at Farmers' Institute, Madisonville, Lackawanna Co., Pa., December 7, 1898.*

"Some men are born great, others obtain greatness, while still others have greatness thrust upon them." Some men travel around the country on their cheek, others on their reputation, and still others on some politician's railroad pass. I am sorry that I have no greatness whatever, inherited, attained or thrust upon me, nor am I able to travel like many other men.

To put the matter in few words, I am here in rather an embarrassing position, and will be glad to sit down before all the rest of you are embarrassed too.

I feel a great deal of responsibility resting upon me in addressing an audience of farmers. You have all heard the story of the little boy when his teacher asked him for the definition of responsibility. The little fellow was barefoot and without a coat. His trousers were held up by a single strap over the shoulder, which was fastened to one button in front. After thinking a moment his face lighted up as a bright idea struck him and replied:

Well, I can't give you the definition of responsibility, but I can give you an example."

"All right," replied the teacher.

"Well, marm; you see that button that is almost off?" he said, pointing to the single button on the front of his pantaloons.

"Yes."

"Well, marm; there's a pile of responsibility resting on that button."

Although I feel a great deal of responsibility resting upon me, I do not expect anything serious will happen. I sincerely hope not, at any rate.

When we speak of the farming interests we speak of about 90 per cent. of the population of the globe. In these days of mechanical en-

terprise and ingenuity, there is a great tendency to think that by far the greater portion of mankind are earning their living in the mills or factories. Such an idea is far from correct. Although most marvelous advances have been made in science and the mechanic arts, agriculture has not been lagging behind. Christian civilization is the herald of advancement; but education is the foundation stone of Christianity. Applied education is the motive force of every noble enterprise, and agricultural interests advance, only as fast as education is brought into contact with them. As Washington has very truly said: "Agriculture is the most healthful, most useful, and most noble employment of man." Since this is so, why do we not urge a more earnest systematic study of the first principles of agricultural education?

The question naturally arises: "What is agricultural education?" Perhaps the application of education to professional life in the past, has opened the road to inconsistency and prejudice. It seems as though many of our thrifty farmers have the idea that a man does not need an education to be a farmer, and not a few express these sentiments. However, I do not believe that there is any trade, profession or calling that has, proportionately, so large a number of followers that are failures. So at least let me answer this question in the negative. An agricultural education is not the study of theology, pure and simple; it is not the exclusive study of law; it is not the study of medicine alone. Too many people think that in reality there is but little in education except theology, law, medicine, and the mechanical and fine arts. However, when we study deep enough, we find that scientific agriculture is the broadest field for research that is found in any college curriculum. The most charming studies and the most intricate problems of nature are in the province of applied agricultural education.

We might say that the fundamental principle of agricultural education, is that of organization, and the benefit derived from agricultural organizations. Civilization makes the individual man more and more dependent on his fellow man. Primitive man was a little world within himself. He was his own mechanic, weaver, tailor, miller, baker, manufacturer, warrior and everything combined. He did not depend upon the factory for his clothing, the shoemaker for his shoes, the miller for his grain, or the manufactory for his machinery. Every article of clothing and food, for necessity and comfort, was the direct result of his own labor. Civilization divides this labor and makes man more and more dependent on his fellow man. With this common dependence we find the origin and necessity of combined action, as opposed to individual action, i. e., this is the origin or organization.

Organization is nothing more or less than a consideration for the common good. Thus the farming community finds its first chance of education in organizations where general discussions, exchange of opinions, demonstrations of experience and general intercourse broadens the fields for investigation and research. Many such organizations like the Grange and Farmers' Alliance take up this work. Special organizations in localities, tend to help in specially defined lines of work. I need but mention a few of these things. One step farther will bring us to the interest the government has taken in the farmer, and very justly too. Probably, next to a college course, nothing is so productive of definite results in the line of spreading agricultural knowledge, as the Farmers' Institutes. You all know what these are and it will suffice for me to say, that none of us fully realize what these are doing.

For the young man who wishes to be the successful farmer of the near future, a fair knowledge of reading and writing will not suffice. Scientific methods and principles are being employed on the farm to such an extent that he who is unacquainted with the principles of science, will not be able to compete with his more highly educated neighbor. The demand is for college bred men. Nor will it do for the man to go through college, as a certain fellow said he did. A young man was telling that he went through college in five minutes. He went in one door and out at the other.

In addition to defined college courses and special courses, may be found, at present, correspondence courses of great value, treating on the composition of feeding stuffs, plant life, manure and other fundamental principles of farming. What an agricultural education is and what it means can never be realized until the education itself is attained.

Some people declare that there is no science in farming; but I wish to say that it is not all luck. Mr. Geo. W. Peck says, "that up in La Crosse Valley a few years ago a farmer got drunk, and remained drunk for three weeks, while all his neighbors were sowing their wheat, and he never turned a furrow. They all pitied him and his family, as they looked at their fields all dragged in nicely. He sobered up about the time wheat was sprouting and went to work and plowed and sowed. The result was that the wheat sown early was destroyed by rain, rust and nine kinds of bugs, and they never harvested at all, while the drunken man had twenty-five bushels to the acre." It is just as absurd to try to justify drunkenness with such an example as it is to try to prove that farming is all luck. There is no luck in it. It is simply hard brain and bone work, and a man must have both strong and well cultivated in order to be a success on the farm.

The why of an agricultural education, also opens up another field of almost endless research and discussion. This is the age of lightning. The old coach has given way to the electric car, the postman with his pony and saddle bags to the telephone wire, the emigrant wagon to the limited express, and the spinning wheel to the massive looms of the factory. The world of mechanical industry and of science has undergone a radical change, but all depend on the farmer. The farmer must keep pace with the times or the times will pull him out of a job. Reminds me of the city lad who decided to go to the country and get a job. The first place that he came to was where an old farmer was leisurely plowing with a yoke of oxen. The young man climbed over the fence and bantered the old man for a job. Farmer-like the old gentleman began to ask him if he could do certain things about the farm.

"Can you hold the plow?" he asked.

"Certainly," was the reply.

The old gentleman decided to try him, so he let the fellow take hold of the handles while he started the oxen. The plow run out of the ground and nearly knocked the poor fellow down.

"I thought you said that you could hold the plow?" said the farmer, stopping the oxen.

"So I can," he said, "but not when them great bulls are a-pulling it away from me."

Progress is hitched to the farmer's plow, and unless he is up to the times, he will find that progress is pulling it out of his hands.

The resources of our American farms are wonderful when proper methods are brought into action. America is the natural home of many of our most useful vegetables and plants. It reaches from the frozen north to the tropical south, and opens up a world within itself. It is inexhaustible in its resources; the world relies upon it and it now demands skilled men to bring forth its hidden wealth. The farmer must keep pace with the mechanic and inventor. It is to-day as it will be in the millenium, to a great extent, when we compare the present with the past, "The former things have passed away, and all things have become new." A new earth is dawning on the American farmer, and the times demand that he be qualified in every respect to meet this new state of affairs.

I am not a politician, nor do I intend to give you a political speech, but I wish to say that the farmer needs to be educated in the duties of citizenship, more than any other class. The world depends on the farmer for its daily bread, and unless the farmer is protected in his interests and not imposed upon, the whole world will suffer. The farmer should be the law-maker of our land. The times demand protection for our farming interests and the farmers are the ones who by

their own efforts, must bring about a change. The fate of America, as a nation, is now in the hands of the farmers, as a class. As a nation we are losing our proud record of men and women who have come here to seek the welfare of their adopted home. Foreigners, caring nothing for their own country or for this, are coming here and setting up thrones for despots, and transplanting the rank plants of anarchy. Ninety-one per cent. of the population of Chicago is either foreign born or of foreign parentage. There are 40,000 Bohemians 60,000 Italians and 100,000 Germans in separate parts of the city. Almost every tongue under heaven is spoken there. The theaters are open on the Sabbath, the trains are chartered for Sunday excursions, and nearly every band of music is out. Foreigners, just as bad, if not worse than the Chinese, flock to our shores, bringing disease, crime and infidelity with them. To-day the foreigners who come to us are nearly all, either criminals or paupers, or both, those landing in Castle Garden having an average of about twenty-three cents apiece in their pockets. With these curses come the terrible curses of ignorance, superstition and viciousness.

How different from the scene on Plymouth Rock in 1620! These men come here not to till the soil, enrich the country or their fellow-men, but to spread their own vile doctrines and have less restraint. Such men come to us and will soon over-run our land unless American laws stop their landing. This question is of vital importance to the farmer, and it is time that he more fully realizes the price of his individual sovereignty, and wield the sceptre placed in his hand.

There has been a time in our nation's history when the industrial arts needed special encouragement. They received them in the ways of duties and bounties. To-day our manufacturing interests are able to compete successfully with the world; but agricultural interests have fallen behind in the rapid line of advancement. In the State of Pennsylvania about \$5,000,000 worth of corporate property is wholly untaxed, while the rest pays but four mills on the dollar. Farming lands pay from fifteen to thirty mills on the dollar, and all of your farms are taxed to-day. Who is to be blamed? No one but the farmer, for he not only holds the balance of power, but the reins of government themselves. This is another thing that should be remedied, and at once too. But our farming communities are not interested enough in these matters of government to probe to the bottom and then act in the high sphere of true citizenship.

We constantly hear of over-production, hard times, etc., yet we hardly stop to find out the reasons for all these things. Every year the American nation digs a trench ten miles long, five feet deep, and seven feet wide. In this it places side by side twenty-five thousand of the brightest sons of Columbia, and over a billion of dollars. Then

the whole is covered up, the mound kept barren by the bitter tears of poor widows, orphan children and broken-hearted fathers and mothers; and the awful inscription, "No drunkard can enter the kingdom of heaven," placed above it. Not over production, but under-consumption.

To-day, Columbia is beset by many more evils that threaten her very life, and she is now looking upon the tillers of the soil to help her. The farmer must know the duties of citizenship.

I am not a prophet nor the son of a prophet, perhaps, I am a mere idle dreamer, but I see in my vision a day in the future when the true-hearted, sturdy farmers' sons will seek higher education in order to deal with nature in her mysteries and to live as a king in a free land. In my vision I see the man that is to hold the plow and the man who is to lead the way to Eternal Life, join hands on the college threshold, and step out in the world together, respected, honored and loved by all as the two great callings in this universe, in order to serve their fellow-men. Then as these two go out together to deal with the wonderful works of God and their fellow men, they will be able to turn the horn of plenty on the teeming multitudes and supply the hungry throng with the richest temporal and spiritual fruits of God's kingdom.

The one will seek intercourse with his maker through the revealed word of God, and draw therefrom the bread of comfort and life for a sin-sick world, while the other will seek his God and receive, in return, the fruits of the field as a result of deep earnest research and study, to feed the perishing bodies of mankind. Then the two, joining hands as God's choice husbandmen, will use the power of their inherited kingship to administer justice and right to mortals, until the great Judge Himself will take the reins of government in his hands, and provide for His children and govern them by the word of His power.

Let us reach up a little farther, search a little deeper, broaden a little here and a little there, and seek to be leaders in our day and age. Everything depends on the farmer, and the time has now come when mere reading and writing will not place a man in the front rank. The time has come when the farmer, by the aid of the scientist, is to search into the hidden depths of nature, and there find the new jewels and beauties that nature gives to only such as diligently seek for them.

Think more of yourselves than you have before. Realize your responsibility, and rise to meet it with renewed strength, obtained by patient study. Napoleon could inspire his men by pointing to the Great Pyramid and saying, "Men, forty centuries are looking down upon you." To-night, I address you as farmers, and with my finger

pointing heavenward I can say, "Men, eternity and God are looking down upon you." You have a solemn trust, to lead the world in right government as true citizens to feed the world with fruits from the hand of God, and to stand as a living example to all men. Men, betray not your trust, but gain power and strength from patient, hard study and meet the world's needs with a powerful mind, as well as hand, for the world needs it.

EDUCATION.

BY M. E. BEST, *Cowan, Pa.*

I consider a human soul without education like marble in the quarry, which shows none of its inherent beauties until the skill of the polisher brings out the colors, makes the surface shine, and discovers every ornamental cloud, spot and vein that runs through the body of it. Education, after the same manner, when it works upon a noble mind, draws out every latent virtue and perfection, which without such helps, are never able to make their appearance.

Education is a drawing out process. The word is derived from the Latin word "educō," which means to lead out, and to me it implies that there is some natural power in the child's mind that needs leading, needs to be drawn out, or like the marble, needs to be polished.

Every child is endowed with certain natural talents, and they are or should be drawn out, therefore, it should be the aim of every parent and teacher to draw out those talents, and help them move on and on in the proper channel.

Education, as the most of us understand it, seems to belie its etymology. It does not lead out the mind, but simply fills it with a lot of disconnected facts. The mental food is not assimilated and converted into mental muscle. The greatest educational need of an individual is a trained mind, a mind that is ready to act in an instant and not the next day. With most persons the intellectual brilliancy, the proper thing to say or do, comes as an after-thought. An after-thought is always a lost opportunity, and is no more help to a man than a flowery epitaph on his tombstone. A man expects his hand to be ready instantly to perform any motion of which it is capable, but he is resigned when his mind does not act quickly. He says

readiness is not born with people; it cannot be acquired. If a man's body is ill he never gives up until he finds relief. But if he cannot remember names, if he cannot command language, has no taste for music or art, he is resigned and says: "I am as God made me." If the mind is properly trained this trouble ought not to exist.

Mental training should be by analysis, law and analogy. Education aims to quicken, intensify and develop the working of the mind, toning and exercising all the weak parts. It should train every sense, faculty, memory, power, part and phase of mind, every particle of mental muscle, making it instantly responsive to every sensation of the nervous system. Such an education would teach a man to know himself. Whatever man's line of life may be, he needs an education. It is not the mental energy a man uses that tires him, but that which he wastes.

"Some men waste energy enough to run a genius."

The reason why most men have not good minds is, because they have not been reduced to order, and this is just what education should do.

The mind may be divided into three parts, or faculties: Impression, repression and expression. Impression receives all raw material through the senses; feeling or touch, seeing, hearing, smelling, tasting, temperature, and the muscular sense which detects weight. The sense of touch is the primary sense. A small child receives its first impression through touch. It touches the hot stove. You all know the result and the lasting impression it receives. Repression, or memory, is an analysis of this raw material that I just mentioned. It combines, deepens and classifies it ready for expression. Expression uses the materials the senses have received and memory has classified, in writing, speaking, clear formulation of words, drawing, or some other form or outward activity. Any thought expressed becomes modified by meeting new thought, re-enters the mind, is again retained in the memory, again expressed, and this three-fold process is endlessly repeated. In a perfect mind this process is constant and continuous; in all minds it is as natural as the circulation of the blood.

Education as we understand it, it seems to me, is a kind of stuffing process, without much of either memory or expression. The great secret of success in life is for a man to be ready when his opportunity comes. Some men having almost an unlimited supply of knowledge cannot give expression to it, because their minds are not quick to analyze a new subject. They cannot ask a good question. They cannot give a quick illustration, or make a fair description. We say such men have information, but so has a library; he has a vocabulary, but so has a dictionary. To be of service to him in his battle of life,

his information and vocabulary must ever be held in instant readiness.

Mental training recognizes the three divisions I mentioned; gives exercises to keep each in its best condition, and then trains the mind to pass every impression through the three-fold process—a training that soon results in automatic action. The clearest illustration of such action is made, perhaps, through the action of a pianist. At first every movement of the hand is preceeded, or followed by the eye, but finally the hand glides smoothly over the keyboard without direction of the will.

The mind of the child is constantly analyzing. It is constantly seeking to trace effects to causes, or to predict effects from causes. In other words, it reasons from cause to effect, or the reverse.

You all know the child seeks constantly to know how and why, the reason, the law governing what it sees. The child is very wise in its way, it grasps great truths that even men reject.

Parents, if your children ask you the how and why of things, tell them if you know. If you don't know, try to find out for them. In that way you are both learners.

For the benefit of the schools, I will say to directors who are present, if you don't know how subjects in our text books should be treated in order to be of the best service and greatest interest to pupils, ask those who are your co-laborers in education, and whose business it is to know.

If our directors purchase a new self-binder intending to use it themselves, it must suit them. We teachers, however, must use the books that suits some one else. Directors should read section 139 of the school laws of Pennsylvania, found on page 140 of the 1897 edition. As teachers, every teacher has by law the right to vote on the book question. Remember it is the *how* a subject is presented in books that counts, and not the *what* to so great an extent.

Let us look at another side of education for a minute or two. The first question that arises in my mind is, where does education commence? Balton says: "Education commences at the mother's knee, and every word spoken within the hearing of little children tends toward the formation of character." I will strike out the word little, and read it thus—every word spoken in the hearing of children. Children, big and little are great imitators. They imitate all the actions and characteristics of their parents. Therefore, a father can, and does, by his own words, his own example and his entire character, educate his boy to be truly virtuous or else to be a liar, blasphemer, a user of tobacco, a toper, and perhaps all of these. Yet there are exceptions. Some go wrong in spite of all parents or teachers can do. How sad a thought it is to a teacher when he or

she sees a dear boy or girl go wrong in spite of teaching, coaxing and even constant praying, and sadder still is it when we learn that the parent has wilfully undone our work in that direction, as is sometimes the case.

Fathers, send your children to school every day in the week after they start in the fall. Their minds are made for growth and for knowledge. The child's nature is sinned against when it is doomed to ignorance. No child is ever properly educated whose mind is filled with a lot of disconnected facts, and that is all the girl or boy receives who goes to school four days in a week and stays home the fifth. Parents you are accountable for this, except in sickness, in nine cases out of every ten, and you know it. Now don't think me rude or unkind for saying this. I know it, and you do, or need to. I mean, what I have said, to be for your good and for the welfare of your children.

Every American citizen claims to be patriotic, and nearly all would fight for our country; but I tell you, you can do more for it by educating your children. Yes, every man wants our country to be the best on the globe. How will we make it so? By educating our children, physically, morally, mentally and religiously.

"Education is a better safeguard to liberty than a standing army," says one.

Education gives knowledge, knowledge is power, both individual and political. "Knowledge is the wing wherewith we fly to Heaven;" while on the other hand "Ignorance is the curse of God." Let not that curse be stamped upon us. Let us overcome it with a liberal education, suitable for the field of labor whereunto we may be called. Let us educate every faculty, every virtuous emotion and every sense. Thus will we make our people, our State and our Nation the greatest and grandest on the globe.

OUR COUNTRY HOMES.

BY WM. ELY, M. D., *Beaver Centre, Pa., Read at Farmers' Institute, Beaver Grange Hall, Pa., February 7, 1899.*

As we warm ourselves by yonder fire to-day, how little we think that the heat thrown off from it streamed down upon the earth years ago; that it was taken up by the foliage, and by Divine care transposed into trees, and into the fuel which contributes to our comfort

in this room. As we gather around our grates at home, brilliant with the glow of burning coal, how seldom does the thought come to us that the burning heap is but a collection of warm sunbeams which have been stored away in the earth for ages. Oil and gas are but the heat of some carboniferous day. The present warmth of our bodies came from the same great source, the sun. To a great extent, it streamed down in sunbeams last summer upon our fields of wheat, and corn and potatoes, and upon our gardens. We partake of these products and they are consumed in our bodies, producing heat and force.

Thus we see that the heat from the sun warms the earth, enlivens and animates everything its rays can reach. But at this time of the year, like the bird of passage, he has migrated, has gone to give our neighbors in the south a friendly visit, and his rays reach us obliquely. Hence the necessity of fire in this room, and in our homes to-day, and warm wraps when we go hence. From the remotest ages man has felt the necessity of artificial heat, and has utilized it in various ways. At an early day in a nearby county seat was built a tavern, and in the bar room a fire-place. This inn was the rendezvous for the legal fraternity. One very stormy day there was no business at the courthouse, and the expounders of the law were seated in a half circle around the fire-place, telling stories and amusing themselves as best they could. Near night a traveler entered the room, weary, cold and hungry. The lawyers did not give him much attention, and much less a chance near the fire. Finally the gentlemen in the circle ran dry of stories of amusement, and one of them turned to the stranger and asked if he had been traveling. He quietly replied that he had. Another ventured the question whether he had been through Hades in any of his travels. The stranger replied that he had been through the suburbs of the place. Nearly all eyes were by this time turned on the traveler, and another of the fraternity took his turn and asked what the customs and manners of the people were there. The interrogated replied, about as they are here, the lawyers sit nearest the fire.

The subject before us refers only to country homes, and we shall not extend it to others. Most of the old brick fire-places, like that in the tavern referred to, have been torn down, and the grate or cast stove has taken their place. Both are direct heaters. The grate as a heater is perhaps sufficient, but expensive; wasteful so far as heating the room is concerned, but like the fire-place, effective in securing the removal of foul air. Basement heaters are used to some extent in country homes, but the reports which I have gathered concerning them are so various, that it is difficult at the present time to give you any definite opinion about them. As economy and convenience

figure largely in the matter of heating a room, the cast stove has become quite universal, and is likely yet to remain a household necessity.

The materials for heating purposes which are economical and convenient in one locality, are expensive and inconvenient in another. Where gas can be utilized in a home with little expense except the piping, it is the proper material. Where timber is abundant, it would be extravagance to buy coal or gas. In this locality, coal and wood are the main fuels. Whichever is used, it should be dry; wood should be seasoned, or partially so, as then less gas escapes into the room to contaminate the atmosphere, and there is less warping of the fire box.

The ventilation of our homes is of vital importance. The air we breathe is a mixture of gases, only one of which is wholesome and life giving to the animal kingdom, the others are expelled as poisons. It is estimated that every person should have, at least, one thousand cubic feet of fresh air every hour. A cubic room ten feet in each of its dimensions would give this amount of space. Yet how seldom is this requirement met with in our homes, especially in the colder months.

Take a mouse and place it in a common fruit can and screw on the cover as is done in the preservation of fruit, and what is the result; the rodent dies in a short time. A plant may be placed on a table and covered with a glass jar and wax placed around the edge where it rests on the table, and soon the leaves droop and the plant dies.

People do not think of placing themselves under a glass receiver, but they do that often which is nearly as fatal. They will calk around and between the sash, hang quilts before the windows, put weather strips on the doors until the room is almost as air tight as the sealed cans in which the mouse and plant smothered. Often in the sitting rooms and in the sleeping rooms, people breathe over and over again nearly the same atmosphere, until the oxygen, the life-giving principle, is exhausted, and the air is charged with deadly poison. Air should not be as long used as the whisky I once heard of. A Washington man advertised that "he had for sale whisky that had been drunk by all the Presidents from Gen. Jackson down to the present time." In regard to the atmosphere, we are not driven quite to this extremity. It extends above us to the height of fifty miles. Presses upon us from every side, fifteen pounds to the square inch. Through this great abundance "it is not without money and without price." It does cost to warm it in a room from the zero point to sixty-eight. But would it not cost far more to limit the supply in our rooms and have it contaminated, to breathe air impure and have pale

faces, pale bodies, diseased blood, diseased lungs and weakly constitutions?

To admit air into a room, run a two-inch tube from without into the room near the stove, or admit the atmosphere through the transom. When these means are not available, and the window is of two sash, place beneath the lower sash a little block nearly one inch thick and lower the sash. There will be a constant current of air passing into and out of the room. The currents being midway between the floor and the ceiling, will not be felt as a cold draught, and will be quite uniform. If the window is of one sash, we take it for granted that the sash is suspended by weights, and then an open space can be given. The foul air in an over-crowded church will affect both speaker and audience, and has often caused the minister to say that his hearers were unappreciative, and the faithful flock has in turn said, that the minister was uninteresting. Both accusations might be obviated by admitting at the right time fresh air from Nature's laboratory.

Many complain of getting up tired in the morning. This too is often due to improper ventilation of the sleeping apartments during the hours of sleep. Early each day, give the rooms a thorough airing. Several times I have had occasion to visit the State Hospital at Warren, where there were over seven hundred inmates. Though I have seen but a small part of the enormous structure, yet at no time, nor in any part through which I passed, could I detect, only in the slightest degree, any offensive odor. I was told that the reason of this was the provision for the continual change of air.

Man will die for want of food in from two to three weeks; for want of sleep in ten days; for want of water in seven days; and for want of air in five minutes. We partake of food usually but three times in the twenty-four hours; but we partake of the atmosphere about one thousand times in an hour. What then is the purpose of ventilation, what is the office of respiration? What are the effects of pure air? It is to keep in a healthy condition for each one of us, a lake of blood. It is no stagnant pool, but a living tide, constantly ebbing and flowing with each beat of the heart, and its crimson surface is fanned by our breath sixteen times every minute. When its motion is retarded or arrested, disease and death follow. When to the surface of human blood the pure air of heaven is brought, it feels the the muscles for labor, and man gets his bread by the sweat of his brow. It feeds the brain for thought, and poetry, music, eloquence and art have their birth, and man becomes the man immortal.

"God said, let there be light, and there was light." Next to heat, it is the most important agent given us. How cheering as it crimson the hill tops and forests in the morning. As it steals through the

windows and bids us arise. This sun-light gives the green to the forests and meadows, the variety of colors and tints to the flowers, and turns the dew drops into sparkling diamonds. That which is so choice, so vivifying to the vegetable kingdom, has a corresponding effect upon the animal. Those whose labors are out of doors, receive it in abundance. Those within doors would receive more light if they would establish a new custom in regard to the shades. It would be better to attach shades at the bottom of the window, admitting light through the upper glass. From the sun we receive heat and light, electricity and magnetism. Many, for fear of being overcharged with these, darken the windows, ride out in closed carriages, carry a parasol and veil the face. The ladies may think that I am rather out-spoken, but you all know that it would be homicidal to your plants to place them in a dark room a short time. Potato vines allowed to grow in a cellar, are colorless and spindling. Our bodies are made up of the same material as plants and in most respects are subject to the same laws. The blessed purpose of light is to give growth and strength to our bodies, inspire us with good thoughts, and insure light hearts, ruddy cheeks and cheerful faces. We see that birds of the most gaudy plumage, fruits of the finest flavor, spices of the rarest aroma, are found where the sun's rays are the most direct. Beautiful sunlight! Why exclude it from our homes by the use of blinds and shades.

In regard to artificial light, I can add little to what you already know. The tallow dip has been supplanted by the mineral oil, and that in turn is giving way to the electric glow. The time is near, when in our homes night will be turned into day by the incandescent lamp. When electricity will furnish us heat, light, and motive power at so little expense that every home will have it. Until that time comes we must be content to make proper use of what we have.

Light should be of sufficient strength that in our work or reading the optic nerve will not be over-taxed. Near-sightedness, is due to an abnormal increase of the anterior posterior diameter of the eye. Often the cause of this can be traced to insufficient light, close, hot rooms, and continuous study or work, when the body is weak and the optic nerve weak. The treatment, or rather the prevenative of this is suggested by the causes just given.

Excuse me for being personal, but there is one thing in particular which I wish to mention right here. Some years ago a few gentlemen in this town boycotted one part of my business. I do not know as they had any intention of doing me personal injury at the time, but I was left out, nevertheless. Before this so-called boycott, I was having from three to ten cases of typhoid fever each fall. One of these public benefactors was so bold as to put up posters in con-

spicuous places stating that no cats or rats could commit suicide in rock-driven wells, and for a few years these well men had a thriving, driving business. As a result, nearly every farmer around here now has, at least, one of these wells, and it is now rather the exception, that the rule, that I have one case of typhoid fever in a year.

What is the lesson to be learned from this? Water is the natural drink. Beasts seek it. Man receives it without teaching. It is above us, beneath us, and 70 per cent. of ourselves. No heart broken widows or starving orphans mourn because of its plentitude. It is God's water of life. It builds up the body, cleanses it without and within, and keeps it fresh and pure.

Pure water, sparkling, bubbling, limpid, right from the "old oaken bucket," has its place in the economy of man. It is a medium in which the approximate principles of life gather unto themselves growth and activity, and no alchemist can furnish a substitute. Cleanliness, pure air, pure food, and pure water, the elements necessary for good health. Without these, morbid changes take place, the body becomes a hot-bed of infection, swarming with micro-organisms, little destructive vandals, against which often no repairs can be established. A few days or perhaps weeks of disintegration by these, and the doctor is succeeded by the undertaker.

The occupants of a country home are responsible for the sanitary conditions surrounding it. The husband does not of necessity pass all of his time around the house. In fact, most of his work is away from it. But the wife and smaller children are kept closer. The wife occupies a position of corresponding influence and importance with the husband. We must look to the house-wives for the rearing of children of strong frames, strong nerves, heroic hearts. Those sent out from the parental roof, physically, intellectually and morally qualified to perform the duties of life. This can best be done by having the surroundings pleasant and healthful; keeping the yards clean; casting all slops, excretions and garbage some distance away, and where the rains, winds and sunshine will have free access. Recent experiments made in the Pasteur Institute, have shown that bacilli exposed to the sun and air were destroyed in two hours, while those exposed to the sun, nearly all air being excluded, were alive after fifty hours. Thus it was ascertained that the oxygen of the air had a marked effect in destroying the bacilli.

Cellars should be well aired, decaying vegetables removed and the walls washed, or what is better, whitewashed. The air should circulate freely through all spaces beneath dwellings. Soil-moisture should be drained away from houses as much as possible, for many diseases of an insidious beginning have origin in damp soil.

Germicides can be used with marked effect in many places. Ger-

micides are substances which, when brought in contact with a germ, destroy it. No living thing can live in boiling water. Hence all dishes, vessels and clothing of a sick room should be disinfected by this means. Privy vaults, cess pools, &c., can be disinfected by other substances. Four oz. of chloride lime to the gallon of water will be effectual. One eighth oz. of corrosive sublimate to the gallon will be sufficiently strong. Whatever is used, do not be content with a limited quantity. There is no middle course. You either destroy the germ, or you do not. A slight excess can do no harm; an insufficiency is waste.

Bloody-flux, small-pox, plague, cholera and many other dreaded diseases, which fifty years ago claimed regularly their yearly tribute of victims, are becoming almost diseases of the past, and one needs not a prophet's eye to foresee the time when these will be no more.

For many years men have devoted their greatest energies to the making of the most destructive guns, and recently there has been conferred the greatest applause and honors on those who have used them with such destructive effect. Equally deserving of honor and applause are those who are bringing preventive medicine to such a degree of perfection that the occurrence of epidemics in a community will be felt as a gross reproach. Equally deserving are those whose aim is the preservation of life, not its destruction.

People are realizing that suffering and sickness are not an inevitable and necessary part of their nature. The day of superstition is fast drawing to a close. Mankind no longer believes that diseases are produced by demons, evil spirits, comets, etc. These impressions are disappearing before the light of knowledge. Education along the lines of health is growing in all civilized nations. The enactment of laws or measures to this end, enter into the polity of every nation which hopes for perpetuity and power. And to-day as we stand along the paths of sanitary and hygienic advance and review the past, we see through what evolution these kindred sciences have developed. As we note the work and endeavors of men now gone, men through whose efforts successes have been made possible, we are impressed with the fact, that while much has been discovered and revealed to us, that we, like those in the past, are making discoveries for those to follow. These subjects will have still fairer pages that will be read by those succeeding us. We may think that we understand bacteriology. That we understand the laws and workings of micro-organisms sufficiently to enable us to combat their evil influences and effects. In a measure we do. But there is still a great ocean of truth undiscovered, the knowledge and enforcement of which will keep our bodies from getting rickety and falling by the wayside, and keep our brains active and clear. Now to sum up in the words of the poet:

"Take the open air, the more you take the better;
Follow nature's laws to the very letter.
Let the doctors go to the Bay of Biscay;
Let alone the gin, the brandy and the whiskey.
Freely exercise; keep your spirits cheerful;
Let no dread of sickness make you ever fearful.
Eat the simplest food, drink the pure cold water;
Then you will be well—or, at least, you 'oughter.'"

There is a German proverb which says:

"Freude, Maessigkeit und Ruh,
Schlieszt dem Arzt die Thuere zu."

As translated by an English poet:

"Joy, temperance and repose,
Shuts the door on the doctor's nose."

HOW TO MAKE A FARM HOME ATTRACTIVE.

BY MRS. ALICE H. SIGGINS, *Tionesta, Pa., Read at Farmers' Institute, Tionesta, Forest Co., Pa.*
January 7, 1899.

It was a wise man who wrote: "Half the sting of poverty is gone when one keeps house for one's own comfort and not for the comfort of one's neighbors." Trying to keep up appearances on a modest income has caused many heartaches and failures. Let us have a standard of our own, based upon our own tastes, our own needs, our own incomes, and bravely adhere to this rule. Unless one's income is sufficient to well furnish the entire house, it is far wiser and more economical to commence at the kitchen and make the most important rooms comfortable and attractive.

The parlor is by no means an essential; and if economy is to be practiced let it be the practical kind which does not consist of draperies and fine furniture at the expense of a desolate kitchen.

The home is the expression of the homekeepers faithful interest in domestic affairs, and must prove the fact of her economy of time, strength and money. She should pride herself in the ability to make a little go as far as possible, and so oil the machinery of service that it seems to run itself.

President McKinley, addressing a company of aged men and women, early settlers of northern Ohio, said: "It is a proud pleasure

to me to be able to credit to my wife and to my mother whatever good things my fellow-countrymen ascribe to me. To wife and mother mankind is indebted for those high moral qualities, gentleness, truth and virtue, which are so indispensable to good character, good citizenship, and a noble life. Our whole political fabric rests upon the sanctity of the American home, where the true wife and mother preside. They teach the boys and girls purity of life and thought, and point the way to usefulness and distinction. The world owes them more than it can ever repay. The man who has a pure and true love for mother and wife requires no bond for his good behavior, and can be safely trusted in every relation in life."

There is much solid comfort and happiness to be found in a farm home. But after all every thing worth having costs hard work and one to have an attractive home and happy surroundings must prove himself a faithful toiler. "Whatsoever ye do, do it heartily." Some one has said, "those of us who complain that we are always busy have great cause to be thankful. Many of us would be most wretched if we had an abundance of time to ourselves and no work to put into that time. There would be no pleasure in the night rest if it were not for the days work. Overwork is injurious; but regular, legitimate work which occupies us during the long, busy day, is more to be desired than time to ourselves."

A mother must gain a knowledge each day of what is going on in the world that she may be a guide to her children. There has never been a time in the world's history when books have been as cheap as now. Complete sets of histories and essays, such as in your young days only wealthy persons might have in their libraries, can now be had for the most trifling sums. "However much your children may get ahead of you in real, solid knowledge, you can easily keep pace with them in general reading, and there is no better culture for the mind."

Courtesy and gentleness should be strictly observed in the family circle. "A life is well lived only in proportion as it has exerted an elevating influence over other lives." To be helpful to others is one of the highest Christian duties. Fathers must take time to get acquainted with their families. The wealth they are accumulating may be "doubtful blessings to the sons who are strangers to them." "The deepest secret, as well as the mightiest force of life is love. Without love there is no enthusiasm. With no wide reaching affection and no uplifting ideal we make of our life a treadmill and of our duty an unwelcome drudgery. Small affections keep small the heart and low the temperature of life."

Innocent amusements must take prominent places in our homes, and none is more refining than music. Social enjoyment is neces-

sary and true hospitality, remembering Mr. Emersons injunction, to let "no emphasis of hospitality lie in bed and board; but let truth and love and honor and courtesy flow in all thy deeds." Flower culture adds to the general attractiveness of the home. A few thrifty growing plants give a brightness to a room which can be obtained in no other way. But do not have plants enough to shut out the sunshine and pleasant views. No matter how closely you economize in other furnishings, be generous with your lights for the tables and rooms. "A half-lighted table is sure to be a glum one." Rational eating is essential to good blood, good muscle, good brains, good nerves and vigor of mind and body; and while we are growing wiser we are becoming, through the help of good cook books and good judgment, physically stronger. If the brain is thus developed, the acquisition of knowledge will be rapid. Mr. Bok said: "The human mind always grows to suit its outward surroundings."

Originality and a development for great things has naught to check its growth where one can look with earnest eyes from nature up to nature's God. There is no place on earth which is nearer to nature's heart than the farm. "Farm life pays if it leads him who follows it one step higher than he was at first."

The Hon. H. C. Adams, of Wisconsin wrote: "Let the American farmer be happy that he lives in a country where industry and honesty can win the great prizes of life, that he lives in a country that he can rule if he will, happy because foreign markets are opening more widely each year to his products, and happy because this nation has come triumphantly from the horrors of war into the sunlight of peace and good-will toward all men." All the world reveres to-day our farmer boys of fame. Not one American President, from first to last, was born in a city. Let the industrious continue to build, and let the vigilant continue to watch. Universal peace will some day reward universal industry.

"Happy he, whom neither wealth nor fashion,
Nor the march of an encroaching city,
Drives an exile from the hearth of his ancestral homestead.
We may build more stately habitations,
Fill our homes with paintings and fine sculpture,
But we cannot buy with gold, the old associations."

QUALITY AND PREPARATION OF FOOD.

BY MRS. JENNIE MILLER, *Conneaut Lake, Pa., Read at Farmers' Institute, Beaver Grange Hall, Pa., February 7, 1899.*

The subject that has been assigned me for this occasion is an almost inexhaustible one, and were we to try to fathom its great depths, it would take the entire time of this session; but owing to my lack of ability to portray the many hidden truths of this great subject, I shall only call your attention to a few of the most important points.

"Quality and preparation of food," is a very common household phrase, and at first sight, we are ready to exclaim that we know all about it; but in taking the second thought, I think you will readily agree with me in saying that this subject is one of the laws of our physical welfare, that is not only the most neglected, but is also one that we have never studied as we should. We take it for granted, and it is also a self evident fact that food is that which sustains life.

To begin at the source, I shall first call your attention to the air we breathe; for of all the agents in sanitary science which contribute to the health and longevity of human beings, air necessarily stands first, as compared with water, soil and other food. As the air comes nearer to the blood in the lungs than do the fluids of the alimentary canal, does it not behoove us as intelligent beings, to seek pure air and avoid every means of contaminating the same. I am persuaded to believe that all infectious and contagious diseases are, to a certain extent, preventable, because the air as well as food and drink is one of the mediums through which the germs are transmitted. We are willing to admit that the germs of any infectious or contagious disease may be found in the air, but they are by accident. The air is not a natural habitation for bacteria, and is of itself a non-supporter of them when they enter. Sunshine and dryness, the great auxiliaries of pure air, and which is within the reach of every ordinary household, is antagonistic to germ life. These scientific demonstrations come home to us in everyday life. But there is a class of people called "Christian Scientists," who believe there is no such thing as disease; and there is another class called "Faith Healers," who believe faith alone is sufficient to cure all diseases, and that every epidemic of disease that has carried hundreds to

eternity, was God's will, and that the Divine Providence was manifested in this way.

These classes of people are among those who have the monk's conception of disease and epidemics, and by their refusal to submit to what science has revealed, violate the highest laws of God and man. But we have reason to be very thankful that we are living in this era of the world, where medical chemistry and the microscope have succeeded in unraveling many of the myths of old, which show us that years ago, far more than to-day, ignorance and negligence were accountable for the spread of epidemics and the continuation of plagues.

We should also feel very grateful that it is no medical secret, but is being taught in our public schools, where every boy and girl can learn the fundamental principles of hygiene, its sanitary laws, the results of impure air, and the ways and means to keep pure and healthy. We can in a measure overcome many of the evils of bad water, or an infected soil, but a vitiated atmosphere we find a much greater task. We read in Holy Writ of the plagues that were sent on Pharaoh. He thought he was able to counteract all of them, he could stand to have the water turned into blood, at one time, and the soil filled with frogs and lice at another time, but when the air became contaminated or loaded with flies, he was willing to let God's people go.

The question now presents itself is, how are we going to doctor the air? If the food we eat becomes infected, boiling or roasting it destroys all germs. If the water we drink becomes contaminated, sterilizing or filtering purifies it; but if the air we breathe becomes polluted, what are we to do? It would be well for us, first, to notice that nature always does her work well when unmolested, and her ways are worthy of imitation and observation. Her manner of purifying the air is similar to that by which water is purified, and we must imitate her method as closely as possible, when we wish to doctor the air. We all know that when the air is not in motion it becomes stagnant, as water does, and becomes bad and offensive, and the receptacles of disease germs. Here underlies the great secret, viz: That we meddle with nature and confine this great bane of human happiness, by depriving it of its freedom. I have reference to the proper ventilation of our dwellings, which is worthy of our attention. We need not go away back to what is called the "Black Hole of Calcutta," where the greatest lesson ever taught on the subject of ventilation was on the night of June 18, 1756, when one hundred and forty-one English prisoners were crowded into a room 20 feet square, and at the expiration of eleven hours only twenty-three were found alive; but we can take a lesson under our own roofs in our own homes.

where we would feel almost grossly insulted were any one to enter and tell us that they were not scrupulously clean, but that there was a skeleton behind every door.

How often do we find the sick chamber, the most of all, scrupulously clean to the naked eye, and our loved ones, whom we nurse so tenderly and administer to their every want. Yet at the same time we are withholding from them one of nature's great restorers, sunlight and proper ventilation, and feeding their emaciated bodies on stagnant or polluted air.

"Charm aches with pure air, and agony with words," is one of Shakespeare's sayings, but is as true to-day as when written, and far more suggestive, because we understand better the beneficial effects of pure air upon various bodily aches and ailments, which yield very slowly, if at all, to medicine alone. Assist nature and not supplant her should be our motto at all times.

In addition to the proper ventilation of our dwelling apartments, let every household be a committee in preparing pure air for its occupants, by fumigation, by cleaning up all the waste and garbage in the back yards, and in the cellars. See that the drain pipes, the sewage and the kitchen sinks are in perfect order and scrupulously clean. Let the rays of the sun have free course, and I venture to say our doctor bills will be few and far between.

The second point to which I wish to call your attention is the next indispensable ingredient in the quality and preparation of food, viz—water. We shall but briefly confine our attention to the personal use of it, of its paramount importance to man. That water is a food is shown by the fact that it is the chief ingredient of all the fluids of the body.

This being the case, is not its supply an exceedingly important one, as the purity and wholesomeness of water, like pure air, have much to do with the preservation of health, and the prolongation of life. There is no doubt that throughout this country, thousands of precious lives are lost annually and many more thousands endangered by polluted drinking water. To have an intelligent idea as to the purity of a water supply, it is important that we know the source from which it is obtained.

Of all the sources of water, probably the worst, since most liable to become contaminated, is the river, lake and stored surface water. The best and purest are the springs and artesian wells. The next in purity is the ground water, which has been filtered through from 8 to 10 feet of soil; but these above stated are not always within the reach of all, so we must resort to some system that is. Unless we are certain that our drinking water is uncontaminated, we ought never to drink it raw. Boiled water can be easily and cheaply pre-

pared in the ordinary household. The great objection that is waged against it is, that its taste is flat, and that it is such a bother to prepare it. I will state that the taste can be greatly improved by pouring it back and forth from one vessel to another in a pure atmosphere, and I think if we could see it through a microscope in its raw state, the bother part would soon sink into insignificance, when we would consider the safety it secures. Like distilled water, it contains no atmospheric gases, and is devoid of any living bacteria. Scientists tell us that we are practically free from typhoid fever, if we drank only boiled water. We go to considerable expense in insuring our lives against accident, and then we use all caution to avoid them, but I think the number of deaths resulting from the use of impure or unboiled drinking water, outnumber those from accident. Does it not seem then unreasonable that we should neglect such a simple precaution.

The third point I wish to call your attention to are beverages. As to the different kind of beverages now in daily use, if I were to discuss all of them, I would not know where to commence or where to end.

We understand the word beverage applies to those refreshing drinks which we take to relieve thirst, fatigue or languor, or to supply some demand of the system, either real or fancied. If we drank sufficient pure water, and ate only wholesome food in quantities proportionate to our needs, I am very certain our craving for these stimulating beverages would be much less than they are. I also believe if we performed our work regularly, avoiding worry and undue excitement and fatigue, and if in our intervals of work, we enjoyed a proper amount of rest and recreation, good pure water would supply all that the body demanded in the way of beverage. But it is a deplorable fact that these conditions very rarely, if ever, are obtained.

We have a great many kinds of beverages under different heads, viz: Acid, alcoholic and the alkaloids. We do not care to take your time in discussing the use of alcoholic beverages, for the effects of their large and excessive use are, unfortunately, too well known to need discussion at this time. To be brief, we will only say a word about the two most popular in daily use in the class of alkaloids, viz: Tea and coffee. We might ask what effect has these on the system, or are they in any way beneficial or injurious to the system. We might answer that they are alike in that each contains a stimulating principle. We might also say, that tea is a very refreshing beverage, relieves bodily fatigue, sometimes relieves a bad headache, and is particularly grateful to aged persons when the functional activities are getting feeble and need stimulation. As for coffee we might

say that it too removes the sensation of fatigue, allays hunger to a limited extent, and like tea, acts as a stimulant to the tired nerves; but as to the relative value of these two beverages, little can be said. We might say that coffee is more digestible than tea, and again there are persons who can drink tea without any inconvenience, who cannot drink coffee. While to others, coffee is more agreeable than tea. My opinion of both is, that their nutrient value is insignificant; but the large amount of cream and sugar gives them considerable value as a food. I am also of the opinion that a better knowledge of foods and their nutritive values and a better knowledge of the best methods of preparation and cooking of foods, would greatly lessen the cravings for these two beverages.

Lastly, I shall call your attention to some of the solid foods, and the cooking or preparation of them. We might first inquire why we cook our food? This is a question, though simple, may be like some questions our little children ask us—a trifle puzzling. We answer, first, that we cook our food to render it more agreeable to our senses of taste and smell; that cooking develops flavors and odors not present in the raw state. This is particularly true of animal food, and also, to a greater or less extent, to some vegetables. A piece of raw meat or a dish of raw potatoes or beans, would be very repugnant placed on our tables. Again the cooking of most foods may be so conducted as to make them more pleasant to look upon, hence we can say that cooking renders food more palatable, gives a more savory odor, and, if well done, renders it more attractive.

But this is not the only reason. We also find that the cooking of our foods facilitates the process of mastication. Some foods are absolutely indigestible in the raw or uncooked state, that they need to be chemically changed. The fibrous tissue of meat, for example, cannot be considered a food until by the application of heat it has been changed chemically to gelatin. Similarly starch foods though not entirely indigestible when raw, are changed into a more digestible form by cooking. Another very good reason for cooking food is, that the warmth which is thus imparted promotes digestion. These hot soups now so popular on our tables, if given as the first course, assists digestion. Finally, cooking destroys any parasites that may be present in the raw state, for instance, trichinae in pork. As heat destroys bacteria, we are taking fewer chances when we cook our food well than when we do not.

We have now considered briefly why we cook. We will have to say a word as how to cook. It is said the way to reach a man's heart is through his stomach, and the pleasant faces of the sterner sex before me this evening is sufficient evidence that the ladies of this locality are experts in the line of cooking; but pardon me if I make a few suggestions.

We women housekeepers, or at least many of us, are creatures of tradition in the way of saving of labor. We are apt to think it more important to do just as mother did, than to stop and consider whether there be not a better way. Filial regard and the home training given to girls combine to make women conservative and timid about trying anything new in the household. Mother's way were very good, but the tendency in housekeeping to-day, is clearly towards a saving of time and labor, and we certainly have a right to accept thankfully all the new ways that have come to lighten the labors of the home, and which will give the house mothers more time for higher and better things; and it is also one of our rights to demand everything and anything that science can bring to us in the saving of time and strength. Progressive housekeeping means a willingness to accept new ideas; a willingness to do old things in new ways. Fifty years ago all foods had their seasons. Fruits and vegetables were in season only a few weeks or months, and could very rarely be purchased out of their season. Preserves, dried fruit and pickles, were all the fruit they had to offer out of season, and then it took a day or so to prepare them ready for use. To-day, canned fruit take their place, although there is a little prejudice against using it; but I can see no reason why we should not, for it is simply nothing more than fruit partly cooked and preserved from decay by sealing tight from air; but I cannot recommend it where it shows any sign of fermentation or decay. Canned fruits are not only a saving of time and labor, but they give our tables what all American tables need so much, more variety, more fruit and more vegetables. I would like to suggest one thought in the way of caution. The terms "prepared foods" are modern terms used to describe the countless forms of partly or wholly cooked food, prepared for immediate use in the kitchen. I will only say that this is an era of adulteration. Our molasses is bleached by sulphate of zinc, a poisonous drug. Our dried fruits, so beautiful and appetizing, are bleached with sulphur fumes. Our fish, oysters, sausages of all kinds, and scores of meat preparations, such as mince meat, butter, cheese, etc., are artificially preserved by borax or boracic acid. In saying this I do not condemn all, for I believe there are some good brands; but I prefer all these things done by our own hands, and, if they are not so sightly, we can rest assured they are free from adulteration.

I think the great trouble with many housewives is, that they have not a sufficient knowledge of the nutritive value of different foods. We all know, in a general way, that milk is good for babies, and meat for strong men, and here our knowledge stops. We should be thoroughly familiar with those foods that are the most wholesome, and prepare them in such a way that they will be most

easily digested. But I will say right here in justice to my sex, that much of the indigestion that we read and hear about so much, is due to insufficient mastication. We are living in an age of nervous hurry, and have ceased to take sufficient time to eat decently. We rush through our meals, as though everything depended on the rapid disposition of food. Restaurants bear the sign, five minute lunches, and railways announce ten minutes for refreshments, and so on we go at a break-neck speed, and finally succumb to that dread malady, dyspepsia, and then we cooks have to shoulder all the blame for not preparing the food so as to be digestible, and we must quietly endure all their peevishness as a sort of penalty for our ignorance.

As to what foods are the most digestible, no hard lines can be drawn, for healthy individuals differ so widely in their ability to digest what are in general called healthy foods. For example, milk is readily and completely digested by some, while serious disturbance of the digestive organs follows its use by others. Experience shows that the large use of some foods is generally bad, while certain other foods are generally wholesome. The only advice I can give is, for the cook to retain all the nourishment and natural flavor that is possible in preparing the food for the table, and for those who partake, to avoid what common experience teaches is unwholesome or indigestible to your system. Take plenty of time to eat, season well with cheerful conversation, and mother Nature will do the rest.

INFLUENCE AND CARE OF THE HOME.

BY MRS. J. L. RAUSCH, *Pennsburg, Montgomery County, Pa., Read at Farmers' Institute, Pennsburg, Montgomery County, Pa., January, 1899.*

If the coming century is to mark an advance in the life of the American people, if it is to give us better citizens, a nobler manhood, a purer womanhood, a larger measure of health, happiness and prosperity, these blessings must come very largely through the medium of the home. The home is one of the strongest forces in the world's progress, stronger than the combined armies of the nations. It is the home that determines the moral and physical strength of the army; not the sword and the battleship are its power, but the men who wield them. The American home gave us a Dewey, a Schley, a Wainwright and a Miles. It was the intelligence, the courage and the

love of right in the American homes that sent Cervera's fleet to the bottom of the sea, and floated the stars and stripes over Cuba and Porto Rico.

While the army serves its purpose mainly in time of war to destroy and overcome the obstacles that stand in the way of progress, the home is a constant factor in building up the nation; from that source, be it pure or impure, issues the principles and maxims that govern society. The tiniest bits of opinion sown in the minds of children in private life, afterwards become its public opinion. All the worlds great men and women, its statesmen, philosophers, poets, artists, philanthropists and warriors, have come from its homes. They were not the products of its schools; on the contrary, those qualities which made them great were due, very largely, to the influences which surrounded them in childhood and youth. Especially is this true of the influence of the mother in the home. It is she who moulds the thoughts and forms the habits of her children. "One good mother," said George Herbert, "is worth a hundred schoolmasters." John Randolph said, "I should have been an atheist if it had not been for the recollection of the time when my departed mother used to take my little hand in hers and cause me to say, 'Our Father who art in Heaven.'"

Home is more than a mere abode, the place where we eat and sleep, or seek shelter from the summer sun and the wintry blast. It is the place where our children are born and equipped for the struggle of life, where they are fed and clothed and their childhood and youth are developed where the earliest and most lasting impressions are made upon their minds and hearts, and the thoughts and habits formed which cling to them in after-life and determines their future, their happiness or their misery. Perceiving this truth, we realize how necessary it is for the young child to have a good home, where body and mind can develop and grow strong. It deserves better attention than a thorough-bred or a fine cow. We will not dwell on the moral and spiritual truths which ought to be instilled into the minds of our children, but rather speak of the material comforts necessary for their well being.

The comforts of the home do not consist in costly furniture, fine curtains or paintings, executed by the hands of the old masters, or statuary wrought by the chisel of some famous sculptor. These are luxuries which the few can afford. The true comforts are available to all and consist in those things with which we are surrounded in the greatest abundance, namely, pure air, pure water, wholesome food, warm clothing and means of entertainment. One of the first things necessary to the welfare of the child is its health. It should have a good, strong, healthy body.

Health is said to be wealth. Indeed all wealth is valueless without health. Our health is preserved by knowing nature's laws and obeying them. God is the author of the laws of health, and has created the body as well as the soul, and it is His will that none of His laws should be violated. Intelligent people no longer believe that a specified number of days are allotted to each individual person or child, and that when the limit has been reached the person will die, regardless of the care that may or may not have been taken to preserve his health. The Psalmist says: "If by reason of strength they are fourscore years." He gives strength as the cause of a long life, and not the decree of Providence.

It is only by acting in accordance with natural laws, which before she can follow, woman must needs understand that the blessings of health of body, health of mind and health of morals, can be secured at home. Without a knowledge of such laws the mother's love too often finds its recompense in a coffin. That about one-third of all the children born in this country die under five years of age, can only be attributed to the ignorance of the uses of pure air, pure water, and of the art of preparing and administering wholesome food. There is no such mortality among the lower animals.

A home to be comfortable must be clean, unless you do your duty in this respect you are not rendering your best service to the Lord. Cleanliness is not only next to godliness, but it is a part of godliness. It was such, at least, in the time of Moses, the pioneer of sanitary legislation. No one can read the book of Leviticus without being convinced that the quarantine and other sanitary regulations are much older than the nineteenth century. Whatever may be the condition of other parts of the house, there are generally two rooms that receive the most attention, the parlor and the spare room, intended only for the use of the occasional visitor.

These are kept neat and clean, everything in order that our guests may, at least, have a favorable opinion of us, while the members of the family, and particularly the children, must put up with things as they are. Mothers you owe more to your children than to those whom you meet only occasionally, and the opinion of your children are worth more to you in after years, than the compliments of any guest, whatever his station in life may be.

"We have a careful thought for the stranger,
And a smile for the sometimes guest;
But oft for our own the bitter tone,
Though we love our own the best."

For the sake of your loved ones, let the whole house be kept clean, and especially the cellar, that part which is often the most neglected. Drain them well, give the walls a frequent coat of whitewash, and re-

move and burn decaying vegetables. For the comfort and health of your children, let your house be filled with sunshine, not only the sunshine of a good temper and cheerful disposition, so essential to health and happiness, but God's own pure health-giving light. It is one of the greatest of natural blessings, it gives the leaf its color, it paints the flowers, arrays the birds in beautiful plumage and gives life, health and beauty to the children. Plants will not thrive in darkness neither will human beings. Open the shutters, put up the shades, draw aside the curtains and let this gift of God stream in through the windows. If it does fade the carpet, think less of the things under your feet than you do of the lives of those entrusted into your care. Although the children should not be exposed to drafts, they need plenty of fresh air. The air is as indispensable as the light and costs you nothing. All you need to do is to open your rooms daily and allow it to come in. It will of itself render the service needed. We all know of houses, certain rooms of which are never opened except when house-cleaning time comes. The air in them is kept impure and the walls damp from one year to another. Ventilate your house frequently, and the rooms in which you live and sleep regularly. It may perhaps seem to you a matter of but little importance, but you will thereby, probably, save many a doctor bill and the members of your family much suffering and discomfort.

Nothing is perhaps of more importance to the home-maker than a proper knowledge of the quality and quantity of food needed for the family. The food ought to be prepared according to the age, the physical condition and the habits of persons. Food suitable for adult persons cannot be readily digested and assimilated by little children, neither should a person of sedentary habits have the kind of food needed by those engaged in hard manual labor. Cattle are fed so as to obtain the best results. Far less attention is often paid to the kind of food needed by the children, it receives whatever it may ask for at any time of the day. The parent is not the judge, but the child has its own way. Have regular meals for your children as you have for yourselves and give them food suitable to their age and their power of digestion. In addition to proper food let your children have good and warm clothes and pay more attention to comfort than to style.

If the fathers and mothers of our day would devote more time to study the structure of this body which God in his wisdom has given us, as a dwelling place for the soul, if they would observe the laws of health with regard to themselves and their children, they could banish many a cloud of sorrow, avoid many a premature death, bring joy and gladness into their homes, and send forth a generation of men and women far stronger, brighter and better than the present.

DONT'S, FOR FARMERS' WIVES.

BY MISS MARY A. EWALT, *Bakertown, Pa., Read at Farmers' Institute, Bakertown, Pa.,
March 14, 1899.*

Don't be a farmer's wife, unless you understand the situation thoroughly, and are willing to take a goodly amount of prose along with the poetry of life. I know there is much said, and more written about the independent, joyous life on the farm—how a farmer's wife lives near to nature's heart—has the advantages of the fresh morning air and the beauties of the sunshine, etc. With all due deference to these writers, I think this sunrise business is a little over done. I'm sure there are a few of us, at least, who would be willing to let the sun rise alone in his glory occasionally, while we take another nap, if it were possible to do so.

Don't be taken in with all the talk of the romance of the farm and think there is nothing else in it; but look fairly on its more serious side, as well, before you make up your mind. But, having "put your hand to the plow," let there be no turning back. In other words, having put your hand in Joe's, John's, or whatever your farmer's name chances to be, don't, for mercy sake, make the far worse mistake of seeing all the prose of your life and none of its poetry. The poetry is there all right, and now it is your business to look for it, and enjoy it as it comes to you.

Don't wear yourself out doing things that are not necessary. There are many things that cannot be left undone, and the peace and prosperity of the family be preserved, but are there not other things in which you could save yourself a little and nobody be the worse? If you have a bare floor, don't scrub it. Paint or oil it, so it can be cleaned with a mop with half the work.

Many of you iron every scrap of your washing until it is guiltless of the suspicion of a wrinkle, and you are so tired when it is done that you get a "life-is-a-toil and love-is-a-trouble" sort of a look on your face, and it's the hardest kind of work to get up a smile for John and the children at supper time. Now, do you not honestly think you would be doing your family a favor, if you ironed your table linen and things that must be done, just as nicely as possible and then fold your ordinary sheets, towels, etc., and give them the traditional "lick and a promise," and save your strength for the many other duties which are crowding you.

"But," you say, "this is bad housekeeping." Not a bit of it! Nothing is bad house-keeping that is good home making, and it is surely a good plan to keep the mainspring of the home in the best possible order. If time hangs heavy on your hands, and you long for something to while away the hours, then, by all means, give everything a John Chinaman polish. I'm not talking to you; I'm talking to the average farmer's wife, who sees fifty things to do and forty-five minutes in which to do them.

Don't forget how to laugh! If we laughed more we should all be healthier and happier. True, we are a very busy and very practical people, and many of us may find more in our lives to bring the frown than the smile, but, nevertheless, it's a pity we don't laugh more.

The story is told of a woman whose life was filled with a succession of crushing sorrows. She determined to throw off the gloom which encircled her and made a rule that she would laugh three times a day, whether a cause for mirth presented itself or not. She followed her rule faithfully, with the happiest possible results.

There are many things that are honestly amusing around us every day, but the trouble is, we don't always see the fun in them or feel like laughing at it if we do.

"Tis better to laugh than to be crying;
Tis better to sing than to be sighing."

Don't be ambitious to do more work in a shorter time than any other woman in the neighborhood; do not work yourself into a fever, if your house is not always in the apple-pie order you would like it to be. It's nice to have it so. I know, but a house has to be lived in, and it will get torn up, and if with other duties you cannot get around all the sweeping and dusting in one day, let it go until the next, and don't lie awake that night for fear some of the neighbors might come in the morning before you get the top of the front door dusted or the cob-webs swept out of the cellar-way.

Don't make such a hobby of neatness that you drive your family away from home for fear they get things out of place.

Don't be continually telling your husband that "order is heaven's first law." It gives him a chance to make cutting remarks, to the effect that it will be a happy day for him when you have gone where the law is enforced.

Don't think it beneath your dignity to help your husband along with his work if he is in a rush. It won't hurt you to bring the cows from the pasture and milk them too, once in a while, in a busy time. I would not do it too often, for the men, dear creatures that they are, are very easily spoiled, and may come to expect it of you always.

Don't let anything interfere with your children having a happy childhood. Whatever may be said of the disadvantages of farm life

after we have grown, it is, unquestionably, the happiest place on earth for the children. Let them enjoy in fullest measure the wagon rides, the wild romps in the meadows and barns, and when winter shuts them in, don't object to having your chairs used in turn for horses, trains, threshing machines or saw mills. Make a noise? Of course they will. Plenty for your own family and some for the neighbors. You remember what Robert Burdett says about that:

"Let your boy go away from home and you can hire a brass band to play in every room in the house to drive out the awful quiet, but it can't be done; the quiet has come to stay."

Don't look black as a thunder cloud, if your husband comes into dinner bringing with him a man you knew not of. It is a dreadfully hen-pecked husband who don't dare to invite a man to dinner, without first asking his wife if he may.

Don't make any changes on account of your chance guest; and worse than all don't apologize for what you have; making the stranger feel that he has mortified you. If you don't have anything but boiled potatoes, serve him his potato, with so gracious and air, that he remembers after he has gone out, not what he had for dinner, but the kindly hospitality extended to him.

Don't sew at night, with a possible exception of the ever present mending. Not many of us have much time through the day for reading, and I insist upon it that we should have our evenings. Keep posted as well as circumstances will permit, on the leading questions and current topics of the day. A woman in the centre of home duties certainly needs a broader view of life, than the daily routine of house work.

Don't think you would be happier some place else than on the farm. You would not. Show me a woman who is discontented on the farm, and I will in nine cases out of ten, show you a woman who will be discontented wherever she goes. Discontent is largely a habit. Our life on the farm, in spite of its rough side, has many redeeming features that belong to it, and it alone. So cheer up sisters. Let "look up, lift up," be your motto. May you grow younger in heart every year, and may the finger of time leave no wrinkles upon your face.

MUSIC AND ITS MISSION.

BY VINNIE O. MENSCH.

Although the early history of music is, unfortunately, wrapped in much obscurity, we know that in one sense, it is more ancient than man himself, and that the voice from the very beginning of human existence has been a source of melody.

Music is not an isolated art as so many think it to be. It forms a most necessary link in the great family of arts, with its origin at the same source, and its ideal functions the same. No art is more closely connected with the inner life of man than music, and it is one of the great and reliable guides in the study of human progress and development. Music has a higher mission than merely to charm the ear. It is the art which appeals most powerfully to the heart, and through this, affects character.

To what must we attribute the ruin of life? That destroys manliness, mars true happiness, and spoils success. Is it not ill-regulated emotion? We need something to discipline and control our emotions, and we find it in music. Modern music is justly called "the great organ of emotional culture and emotional discipline;" for when properly used and understood it is found to train us in the exercise of our emotions.

The Greek was not far wrong, when he laid such stress on gymnastics and music. He thought nothing complete without the introduction of music to regulate the order, the variety, and the intensity of bodily motions, actions and words; a discipline which made his life that well-rounded model of physical and intellectual harmony and perfection, which has been the wonder of poets, philosophers and sculptors of all ages.

"Musical training," says Plato, "is a more potent instrument than any other, because rhythm and harmony find their way into the inward places of the soul, imparting grace."

He who has received this true education of the inner being, will most surely perceive omissions and faults in art and nature, and while he receives into his soul the good and becomes noble and good, he will justly blame the bad and hate it. "He who has music in his soul will be most in love with the loveliest, and this is the secret of the

highest culture, for devotion to what is truly good and beautiful is in everyway ennobling."

Music is a language, which properly understood and correctly expressed, gives voice to those loftier and sweeter emotions of the heart and mind which common language is powerless to convey. Prose expresses prose thoughts and ideas of existence; poetry advances a step and translates feelings and passions; music advances yet another step and becomes the medium for those dream-like imaginings of the heart and mind which dwell in a region beyond the atmosphere of the work-a-day world. It takes us away from the common-places and dulness of life. What if it is but a dream, who is not the better for it? It is a blessed recreation, bringing freshness to a tired life and buoyancy to a heavy heart.

Music has been truly described as the "mother of sympathy," the "handmaid of religion," and never will accomplish its object unless it aims not merely to charm the ear, but to touch the heart. There are those who say that our life at the present time is prosaic and mercenary, and if such be the case, our need for music is all the more imperative.

Let us get music into our souls. When hearing music, let us think more of what the composer has to say to us, than of the singer's beautiful voice or of the player's marvelous manipulation. All properly constituted human beings possess the faculty to produce and the power to enjoy music of some kind or other, and the only reason why the vast majority of them do not turn this faculty and this power to proper account, is that they do not sufficiently cultivate and train them.

Let no one say the moral effects of music are insignificant. The piano has done more to sweeten existence and bring peace and happiness into the world than all the homilies on domestic virtue ever yet penned.

That music, however rude and simple, that brings a vision of home to the wanderer, of heaven to those who are ready to faint under life's burdens, is fulfilling its mission, though it break the canon of form into a thousand fragments. Thus when the mission of music is fulfilled, when its lowly as well as its lofty ministries are ended, we may be sure the Great Master will resolve all its harsh discords and perplexing minors into one grand eternal harmony.

THE BENEFIT OF MUSIC IN FARMERS' HOMES.

BY MISS ALMA E. WELKER, *Mercer, Pa., Read at Farmers' Institute, Transfer, Mercer County, February 15, 1899.*

Music is the language of harmony, and its true voice ever speaks of peace and love. It is one of the rich gifts granted by a merciful God to mingle somewhat of heaven's sweetness with much that is bitter and sorrowful in this sinful world—this vale of tears.

Let us look at music, first, from a physical standpoint. We know that the various parts of the body, in order that they may be kept in a healthy and active condition, require to be exercised according to the different functions assigned them by nature. We are provided with a voice which we instinctively use in expressing our thoughts; and first as naturally and surely, do we express our feelings and sympathies by means of song. We may then conclude that both speaking and singing contribute to maintain and even improve the healthy state of the various muscles and other organs called into action when these physical faculties are exercised.

One of the benefits arising from vocal instruction is, the improvement in speaking. Another benefit derived from the study of music is that it serves to develop the sense of hearing, the organs of which, like those of the voice, are not equally perfect in every individual. The influence of singing on the health of children is very marked. The most obstinate prejudice maintained against teaching children to sing arose from the opinion that singing, if practiced at an early age, was injurious to the health. This idea at one time prevailed in Germany. But the most minute investigations made by governments, as well as parents, have proved it to be an error. Hence singing has not only ceased to be dreaded as an injury to the health, but is now known to be one of the best means of giving strength and vigor to all the physical organs it calls into action. Nothing is better calculated to produce the power of free and lengthened breathing than the practice of singing. If this be true, surely we are convinced that singing, provided always it be proportioned to the other physical powers of the singer, is calculated to exert a most favorable influence on delicate constitutions. It imparts vigor to the organs connected with the lungs and thus conduces to a healthy state of all parts of the body.

If we consider music from a moral standpoint, we find it tends to

produce a sense of high moral feeling. It has also a tendency to subdue and soften the soul. Thibaut, the celebrated professor of law at Heidelberg, relates that a young man, his guest, who had listened to a composition of Lotti, exclaimed when he left the house, "Oh, this evening, I could do no harm to my greatest enemy." It is said that Zwingli, the Swiss reformer, when reproved by Faber, afterward bishop of Vienna, for cultivating music, said: "Thou dost not know, my dear Faber, what music is. I love to play a little upon the lute, the violin and other instruments. If thou couldst only feel the tones of the celestial lute, the evil spirit of ambition and the love of riches which possess thee would then quickly depart from thee."

Much might be said along the line of religious music, for it is probable that since the creation, when "the morning stars sang together and all the sons of God shouted for joy," music has been used to express religious feelings. The Apostle prescribes psalms, hymns and spiritual songs as means both of gaining and expressing religious feelings. Religious reformations seem always to have developed singing. Under Luther's administration, and Calvin's government, singing became so general and characteristic, that psalm-singing and the Protestant heresy were synonymous terms. The great reformation under the Wesleys was marked by the outburst of religious music. In the revivals of New England there was as marked a revival in singing as in religion. Indeed, so full were the young converts of song, that they went to and returned from the church with the voice of psalms and hymns. Prof. Edwards in his account of the religious history of that period devotes a special chapter to a justification of this practice, against those who censured it. Good singing in church worship has a power to draw persons to the church and impress them with feelings of devotion. It is a medium of near access to the mercy-seat. It will prepare us to sing in the heavenly choir, should we be so blessed as to attain a place in it. There all will sing the praise of God, although it may be with different degree of sweetness.

If music will benefit physical and morally, if it will drive away care and sorrow, if it is a soother of ills and will bring pleasure and happiness into the home, where do we find a place where it is more needed than in the farmer's home. Where do we find a class of people who, although called by the titles of "Jolly Old Farmer," "Independent Farmer," and other such titles, have more to contend with than they. The great trouble is, that so few of God's human creatures know how to live. When the skies are bright and prosperity smiles around them, they get along very well. But once let the clouds of darkness cross their pathway and the waves of adversity clash over their souls, then they lose their mental poise and prove themselves incompetent

to buffet with the vicissitudes of life. But let the soul be filled with the spirit of music and the heart will sing, though there may be no vocal expression. Note the words of that familiar hymn:

“Though like a wanderer;
Daylight all gone;
Darkness is over me;
My rest a stone.
Still in my songs, I'll be
Nearer my God to Thee;
Nearer to Thee.”

The man who has a knowledge of music and practices singing, is more able to stand up in the face of obstacles and will have more courage to tread the ways of life, unfalteringly. He will not be so ready to grumble about the weather and find fault with what he cannot mend. He will be more able, if his crops fail or times be hard, or business dull, to meet them like a man, and with spirit light and buoyant, still look upward and dash the clouds aside that obscure Hope's beacon star. Who will dispute that the songs which contain such words as:

“The snow is deep, there's a path to break,
But the willing arm is strong;
And work is light if you'll only take
Your work with a bit of song.”

And the words:

“Whistle and hoe, sing as you go;
Shorten the row by the songs you know.”

Who will dispute, we ask, that these words have a virtue in them that will lighten labor, drive away sorrow and sadness, and bring pleasure and gladness in their stead. But we hear some of our farmers say, “Oh, I enjoy music, but cannot sing. I know nothing about music and never had a chance to learn.” Very well, then; the next best thing to do is to educate the children, musically, then after your day's work of weary toil and labor is ended, you can be cheered by the songs from the little ones. For what will cheer more than a song from infant lips when the spirit is cast down beneath the weight of sorrow and trials of this life. In all the world there is nothing so sweet as giving comfort to the distressed and getting a sun ray into a sad heart. Children will, almost always, if they have a home where music lends its charms, learn to stay at home and love it. Music will make a home happier and better. It makes the most dreary place a happy home.

Another advantage of music in the home is, that of entertainment. Of all the arts, music is the most refining, and in its wide scope.

reaching from the infant song to the classical production of the great master, can be adapted to the capacities of all classes.

The science of amusing our friends is as necessary to be studied as any other science. But it must be remembered that the gift of music, like the gift of conversation, is not common to all. The chief aim of parents in the art of music, should be that of real education instead of mere accomplishment. It can never be considered degrading to possess no innate love for music, for in place of this, may exist a love for literature, drawing, and many other intellectual pursuits.

It is a mistaken idea that only those who can exhibit their knowledge of music to the public or in the way of entertainment in the home, have been benefitted by the study of music. True, it must be very discouraging to the farmer or any one who has by hard labor and sacrifice expended a large sum of money to educate a child in music, and then see no satisfactory results; yet the money may not have been spent in vain. It may be doing a work in the heart of the child which may be of infinitely more value than any amount of other instruction that may be given him. A child brought up in the atmosphere of music, will have a smoother disposition, a more God-fearing spirit, and a greater desire to do what is right than any other way it may be educated. Parents, in a measure are responsible for their children seeking associates elsewhere than in the home. If proper amusements and recreations were provided in the homes and parents help the child entertain his associates and make him feel that it was a pleasure for him to have friends, there would be less desire on the part of the boy or girl to leave the farm and seek associates elsewhere. What a comfort it must be to parents, when the shadows of evening gather around to have the children at home and spend the evening in reading, singing or other recreations. And then best of all, to meet together around the family altar and together thank God for his many blessings bestowed upon them during the day, and implore his divine protection through the night. How it strengthens the links around those whom God has bound together as a family.

True, many, very many, of you do educate your children musically; but think of the thousands of homes in our land without music that would have it if they could. How many homes there are where sorrow and sadness reign, that might be made homes of joy and gladness. But how may this end be reached? There is but one way, and that is through our public-schools. Scarcely do we find a city or town which is not giving each child the benefit of a musical education. A few of our country districts have taken up the work, but in most of them we find bright boys and girls growing up without any know-

ledge of music. Oh why are the children to so great an extent neglected? Where shall we go to find purer, sweeter, more full heart music than we hear from the little ones. The child does not sing as the adult sings; it does not sing with its voice alone, but with its whole heart and soul. It does not sing one thing and think another, as nine out of ten of our older singers do. The child thinks of nothing but its song, when it is singing. Its whole soul enters into the exercise. Chas. H. Gabriel wrote: "Oh, methinks the heavenly harpers above will have to tune their harps anew to outvie these little ones."

Those we love we like to see improve in every branch of education and art that will benefit them in this life. And what benefit a child more in this life and in the life to come than a good practical knowledge of music. Singing is praising God; singing is obeying God; singing is worshipping God. Music is an ordinance of God. It is not a worldly invention; it originated in heaven. Singing to Jesus and praying to Jesus are virtually the same thing. We can sing the thoughts of our hearts to as great an advantage as we can speak them, and Jesus will hear and answer a plea just as quickly, be it sung or spoken; but we must be in earnest whether we sing or pray. A whole-hearted singer is very discernible from an empty, thoughtless one. The song of a child has a far greater influence on the heart than the song of the adult, simply because his whole heart enters into the song. Who will not agree with Robert Morris who wrote:

"The birds might well be silent;
The sun refuse to shine;
If infant voices were to hush
Their happy notes divine."

God gave us our voices, and likewise also he gave the children their voices. Whatever God gives, he requires us to use to his honor and glory. Then children should be given all the advantage possible that they may improve the talent God has given them. A child should be taught music the same as reading, geography or arithmetic, and the place where these are taught is in our public schools. Music should be taught there, and a great responsibility rests on us as teachers, and especially on our boards of education. We trust that this great responsibility may be urged upon them, until every board of education in our land, and all other lands, will push forward the great work which has been so sadly neglected. And that the time may soon come when music will hold its place by the side of reading in the education of children, and gladden every fireside by its hallowed pleasures. The children must be musically educated and we must do it or answer for the neglect when God makes up his jewels.

ESTHETICS IN FARM LIFE.

BY MRS. ELIZABETH L. LANDIS, *West Chester, Pa., Read at Farmers' Institute, Black Barren Springs, September 21, 1899.*

There is beauty everywhere, and in everything, but we who see through glasses darkly, are not always able to discern it. God loves the beautiful. No blue is so perfect as the arch above us, no light so golden as the sunlight, no green so fresh so beautiful as the grass beneath our feet. Man's creations are homely, distorted, lack symmetry, but God's are perfect.

The humblest flower growing upon the hillside invites analysis, and is never found wanting in any of its parts. Man built the towns and cities, established factories and trades. God created the fields, the meadows, the beautiful woodlands. He made the soil and placed man upon it to till it. Therefore, farming is of Divine origin, and should be, of all callings, the most beautiful. To many, life upon the farm seems but a life of drudgery and unceasing toil. What a mistaken idea. Who in life has been at all successful without toil? Ever since the edict in the Garden of Eden "By the sweat of thy brow shalt thou eat bread," man has been a creature of toil. In all vocations of life, work predominates. The farmers work is no more laborious than the mechanics or the merchants. With the farmer, work and results go almost hand in hand; it is a sowing and a reaping, seed time and harvest, follow each other in quick succession.

The mechanic toils from morning till night over a piece of machinery, then in its incompleteness, passes it on to a more skilled workmen, and so on for, perhaps a dozen times, it changes workmen before being completed, the result of no particular man's toil. How different with the farmer who prepares his soil, sows the seed, then quietly waits until by and by the tiny blades shoot up, telling him that life has begun, that his labor has not been in vain. Then comes the harvest; you see it above the dark stone wall, golden headed wheat stretching out over the field shaking and undulating in the wind, a bright uneasy cloud of sunset that had rolled down into the field. Certainly a thing of beauty. Then comes the reaping, the well-filled graneries, the over-stocked corn-cribs, the cellars overflowing with fruits and vegetables.

The gaunt wolf of poverty that prowls boldly around the city, finds no quarters in the home of the farmer. We have also the or-

chards laden with their sweet blossoms in spring time, filling the air with delicious odor, till we feel as if the portals had been flung open and we had caught a breath of heaven. Then follows the harvest of fruit, so ripe, so delicious, no fruit ever tastes quite so good as when plucked and eaten fresh from the tree. Again, there is the country garden responding so quickly to the care of the housewife, offering for her table all the fresh delicious vegetables one can dream of. Many of the markets afford good fresh vegetables, but anyone accustomed to their own garden, though the distance be ever so short, they always seem to lose that freshness that makes them so palatable.

Under the subject of esthetics come the flowers, flowers of the country, the home of the flowers, not the rare sickly plants with some long botanical name, that we nurture and pet and coax to grow in our city homes, and feel repaid when they deign to send forth a lone shoot, which bears a pale sickly flower and dies in the effort, but the old fashioned flowers so appropriate to the country homes, flowers that our grandmothers loved, the bright peonies, the tall hollyhocks, the stately dahlias, the gorgeous tulip, and the sweet-scented hyacinths and roses, flowers grown upon sturdy stalks, sending out myriads of beautiful colored blossoms, delighting the eye and filling the air with sweetness.

Some one has said we must love the flowers if we would have them grow, and I have sometimes thought they seemed almost human in their efforts to respond to the care and love of those who are passionately fond of them. If there is a farmer's wife who does not love flowers, I will say to her she is in the wrong place, for if we do not love flowers we do not love nature, and without the love of nature, life upon the farm will be but a dull routine of duty. God in his divine message has often made use of the flowers. He has spoken of "blossoming as the rose," the "rose of Sharon," and the "lillies of the valley," then should we give no thought to the flowers?

Then there are the birds of the country, not the little noisy quarrelsome sparrows that flock around our city homes, but the "birds that make sweet music for us all in our dark hours, as David did for Saul." Nowhere do they sing so sweetly as in the country. How delightful to be awakened in the morning by the sweet melody of their little voices. What instrument has ever given us the sweet chords of these little songsters? What human voice has ever rendered the sweet notes and trills of the meadow lark? How happy, how joyous they are! Did you ever sit and listen to their singing till your soul was lifted up beyond the earthly cares, and you seemed to catch a strain of that heavenly music? And have you not recalled those beautiful words of the poet:

"Do you ne'er think what wondrous beings these?
Do you ne'er think who made them, and who taught
The dialect they speak? where melodies
Alone are the interpreters of thought.
Whose household words are songs in many keys;
Sweeter than instruments of man e'er caught;
Whose habitation in the tree-tops even
Are half-way houses on the road to Heaven."

Thus I could dwell on innumerable things that constitute the esthetics in farm life. And yet while farm life or country life presents the best material and the grandest opportunities for the culture of the esthetical, how sadly it is neglected. Years ago, and not so very many either, any one attempting the culture of the beautiful or artistic in their country homes, were ridiculed for their efforts, and were thought to have aspirations beyond what was necessary for good country folk.

More money and taste were displayed in the erection of houses for the horses and cattle, than for the family. The barn must be large and imposing, it must be light, warm and comfortable, must be painted in bright, gay colors to make it attractive and pleasing to the eye. Of course, this to a certain extent, was a step towards the esthetical, but after all it was only a half step, for where and what was the house of the family? Too often a few rods from the barn it stood, a low, dingy, rickety house, with low ceilings, damp, musty walls, pigeon holes for windows and a lawn that resembled a wilderness. How could any mother ever instil into the hearts of her children a love for the good, the beautiful? Not from the surroundings of the homelife could she glean enough material for a single object lesson. To mothers of refined sensibilities whose whole nature cries out against such surroundings, I should think the task was indeed a difficult one.

Better not attempt it in the home, but take the children out into the meadows and fields, and teach them that God, who is the giver of all good and perfect gifts, has given to them pictures that no artist can paint, songs that no musician can ever repeat, and that nature the great silent teacher, is ever unfolding and revealing to us pictures that appeal to the better, nobler part of ourselves, and by her marvelous relations, creates in us a desire for the good and beautiful in life. However it is in the home, the first impressions are made, and a few hundred dollars less upon the barn, a few hundred more spent judiciously upon the home, would equalize things and make farm-life what it should be, the most desirable of all lives.

However I am glad to observe that the tendency of the times is towards a higher more cultured and more esthetical life on the farm.

The progress in this direction is noticeable in the beautiful and artistic homes that are springing up on the farms all over the country. The closely clipped lawns, the neat walks, the vine covered porches, all show an improvement in the esthetical nature of the occupants. Nor does it require vast sums of money to beautify a country home, a little money judiciously spent, a little taste and tact, is all that is required to make a life in the country very attractive and desirable, for a life in the country is a life in the very heart of nature, and nature constitutes all that is beautiful, grand and good. Those of you who have always lived in the noisy, bustling towns and cities, know not the loveliness of a country home, the quiet days so free from interruption; the peaceful evenings, and the perfect freedom and rest that comes of a life in the country.

Then, is not the country home the proper place to teach the love of the beautiful in life, the esthetics of life? In some people, the esthetical nature predominates, or is a gift, in others it must be largely cultivated, and no place affords the opportunities or is so adaptable to its culture as life on a farm.

There is no other class of men who have it in their power to beautify their homes by surrounding them with some of the most lovely objects in nature, so easily and cheaply as the farmer, and wherever you find a country home in which the esthetical has been cultivated and developed, you will not find the boys and girls wishing to leave such homes for the homes for the over-crowded towns and cities.

FRUIT FOR THE FARM; HOW TO PLANT AND CARE FOR IT.

BY G. A. McCANDLESS, Oakdale, Allegheny County, Pa., Read at Farmers' Institute, Imperial, Allegheny County, January 3, 1899.

Fruit is one of the luxuries of the farm, that too many of us farmers neglect; and it is always enjoyed by the old and young alike, when we have it.

In plating a fruit orchard, the first thing is the location. It should be as high as the lay of the land will permit, and as near to the house as possible. It is useless to plant peaches or cherries in or near the valleys, as the late frosts in the spring, kill the fruit so often, and the buds will be winter killed, when on higher land they will not be hurt. But apples do very well near the valleys, as they bloom later.

We prefer a north or north east exposure, if it can be had on the

farm, as the trees bloom later and winter apples keep better, as they do not mature so early in the season. We have seen a good crop of apples on the north side, near the valley when they would be a total failure on high ground, on account of the buds starting later and not being killed by a late freeze in the spring. But a heavy frost in the latter part of the month of May will kill the apples on low land, when they will not be hurt on high land; and the surest way to have apples every year, is to have them planted on both high and low land, if it can be done on the same farm; and orchards so located, seldom both give a crop of fruit the same year, but come on alternate years, thus giving apples every year.

I will give you my experience with a peach orchard, that lasted for seventeen years, and was located over a hill; part on the north side, and part on the south side. The north side would give a good crop of fruit, when the south side would be a failure, on account of the buds being winter killed on that side of the hill, and not on the north side.

The next thing is to prepare the soil for the orchard. If the soil is not rich enough to grow a good crop of corn without fertilizer of some good kind, it will have to be enriched to grow trees that will give a good return in fruit. The best thing to use then will be barn yard manure, to start with.

Haul out in the winter or spring, about twenty wagon loads to the acre, and spread it as you haul it out. When the ground dries enough to plow nicely, cultivate it, and then if it be a clay soil, put on, at least, eighty bushels of lime to the acre.

We are told that lime is not a fertilizer; that it only dissolves that plant food in the soil, so that plants of any kind can get the good of it; and I suppose this is right. But from experience I have found out that lime increases the yield of all crops, and the more our clay soils have been manured with barnyard manure and cultivated, the more good lime will do them. You should plant corn or potatoes the first season and cultivate thoroughly, so as to mix the fertilizers and lime in the soil. The next spring haul out about ten wagon loads to the acre of as fine well decayed barnyard manure as you can get, and spread it as evenly as possible, and then plow, and pulverize as fine as you can.

This treatment of the clay soils of this neighborhood will fit them so that they will grow paying crops of all kinds of grain or fruit, if the land is dry; and it is useless to attempt to enrich land that is spouty, through the winter and spring, for it must first be underdrained or the work will all be lost as well as the fertilizer. For a fruit orchard, we should select land that is naturally dry. I can not see how an orchard could be underdrained successfully with drain

tile; for if you lay tile near any of our forest trees, the fine fibrous roots soon enter at the joints of the tile and completely fill them and make them useless for underdraining; so I think fruit trees would do the same thing; as they completely fill the ground with roots as deep as the ground could be underdrained.

The next thing to do, is to enclose the plot of land with a good fence, that will protect the trees from the stock; as it does not pay to plant fruit trees and then let the stock destroy them. Galvanized wire fences with iron posts, at least four and one-half feet high, well put up, will last about as long as the orchard and protect the trees all right.

The land is now ready for tree planting. Apples should be set in rows forty feet apart each way, and if on high land it will do to plant peach trees between the rows both ways, for they will all be gone by the time that the apple trees are large enough to occupy the ground. Peaches should be planted twenty feet apart each way, and cherries, pears and plums the same distance. There is nothing gained by planting fruit trees too close together. They must have plenty of light and sunshine to produce fruit of a good quality and fine color. Select good, thrifty, young trees from three to four feet in height. In lifting trees of this size, the roots are not damaged so much as they are in larger sized trees, and are not so hard to set, as the holes do not have to be dug so deep.

After trimming off the ends of all roots cut or broken with a sharp knife, set the tree in the hole and straighten out the roots, and then fill in the fine soil with the hands among the roots. Fill it in so as not to leave any open places among the roots, then tramp it firm around the tree, and finish with a few shovelfulls of fine soil on top, to keep in the moisture. When you finish setting out a tree, cut the top back. Leave only a few buds on apple, cherry, pear and plum trees, for the fewer buds left the better it will be for the tree. Cut away all of the branches on peach trees, leaving only the straight canes. Trees just set out with their roots all disturbed, can not keep a large top of leaves and shoots growing. This is one of the mistakes that is too often made in setting out fruit trees.

If there is plenty of rain the first season the trees will nearly all grow. But as we have no control of the weather, the trees will suffer for lack of moisture and nearly all die.

When the trees are all set out, spread around each tree barnyard manure, to the depth of three or four inches, and at least fifteen inches from the tree; for if the summer should be dry, it will save the trees; and if it should be a wet season, it will do no harm, and will help to give the trees a good start, which is the main thing, for if they only manage to live the first season, they will be stunted,

and will be a good while getting over it, and be longer coming into bearing.

Plant the orchard now set out in potatoes, or any of the low growing crops, and cultivate thoroughly, this season; but do not disturb the manure around the trees. The next season, plow the orchard and throw the soil to the trees. Plow so that the finishing furrows will be up and down between the rows of trees, if on a hillside, so as to drain the surface water. Keep it harrowed this season to kill the weeds and grass; the disk or spading harrow being good tools for this work. Do not plow the orchard again after this season, but keep it harrowed until the trees are large enough to shade the ground around them, and then they will take care of themselves.

Peaches, cherries, plums and pears require very little trimming, after they are set out, to keep them in shape. Peach trees should be examined every spring and fall, to kill the borers that work in the body of the tree at the surface of the ground. These pests girdle the trees by working under the bark and cause them to die. Take a sharp pointed knife, and scrape the gum oozing out at the root of the tree, and you will soon come to the borers, and the wound the knife made will soon heal up and little harm come to the tree. Apple trees require trimming almost every year, to keep them in shape. We are advised by writers in the agricultural papers to head the trees low. But apples on the under limbs of trees that are trained low are never of a good quality or color, and I think we get the best fruit from trees that are trained to grow taller.

When planting a fruit orchard, select varieties that will bear large crops of fruit of good quality. The best varieties of cherries are the Morello of sour varieties. Their time of ripening lasts the longest, and they are the surest bearers and are fine cherries. The Dyc House, Early Richmond, Montmorency and English Morello come in the order named, and give us cherries from the tenth of June until August.

The Montmorency is a fine cherry. The buds never winter kill and it is the last to bloom in the spring, making it the surest bearer that there is. This is the cherry to plant on low ground. It will succeed where all others fail. There are several varieties of peaches that give a succession of ripe fruit from the first of July until late in November. The late varieties pay best to plant in this locality, as they give more time to handle, ripening more slowly and keep better than the early varieties.

The best paying varieties of apples with us are the Hubbardston Nonesuch and Green Rhode Island Pippins. These two varieties are good bearers of fine apples, and of good quality, and no one can make much of a mistake in planting them. The Hubbardston Nonesuch

is one of the best eating apples that grows, and where it is known, will sell the best of any variety. The Green Rhode Island Pippin is one of the best keepers we have, and is a good bearer of fine apples that can be used for cooking purposes from the first of October to May.

This is the kind of an apple to plant. It gives plenty of time to handle them, and they are good sellers in any market. If we get apples that will stay on the trees until time to gather them in the fall, the trees will have to be sprayed a few times with Paris green, after the bloom has fallen off, to kill the larvae of the codling moth or apple worm. The trees should never be sprayed when they are in bloom, for if we do, it will kill the honey bees and other insects that visit the flowers for honey and pollen.

Honey bees are the fruit growers friend. They carry pollen from one flower to another, and thus help to properly fertilize the fruit.

When honey bees are collecting pollen, they never alight on the flower to do so, but touch the pollen bearing parts of the flower with their feet while flying, and then with their wings draw it into the pollen baskets on the sides of their legs, that are formed with a row of very fine hairs for that purpose; and in doing this, they cannot help but blow the fine particles of pollen over all parts of the flower, which is necessary for the fertilization of the fruit. If we plant a single grain of corn by itself, we see the effect of the lack of proper fertilization. There will only be a few grains formed on the cob. There is a thread of silk to every grain, and if pollen does not fall on it, the grain will not form; and if the seeds on one side of an apple are not properly fertilized with pollen, that side will not grow, and then we have an imperfect apple. This, I think, is the reason that we had so poor a crop of apples this season in this locality. The week that the apples were in bloom was cold and wet, and the bees and other insects, could not visit the flowers to gather honey and pollen, and the fruit was not properly fertilized to make a crop.

In conclusion, if we plant a few acres in fruit trees, and plant varieties that will have large crops of fruit of a good quality, we will not only have fruit the year round for home consumption, but we will find it the most profitable piece of ground on the farm.

THE FARMER'S GARDEN—WHAT IT IS AND WHAT IT OUGHT TO BE.

BY MRS. M. C. MARSHALL, *Denton, Pa., Read at Farmers' Institute, Plumville, January 12, 1899.*

This is certainly a most important question for the farmer and his family. So much of their health and comfort depends on the variety and quality of the food used, not only for maintaining the strength of the hardworking men and women, but for the health and proper development of the bodies and minds of their children. For we all agree that to have active, healthy minds, we must have at least tolerably healthy bodies.

The first question asked. What is the farmer's garden? In looking about us we see some very good gardens among farmers, and we see some very poor ones. But they are all noticeably better than when every woman raised her own vegetable seeds. In the better class of gardens now, the men have, most likely, prepared the ground for planting, at least have drawn out the manure and plowed the ground, and the women do the rest. But in too many cases we see the mother or daughters of the house laboring with heavy mattock, or unhandy shovel to break up the hard ground. They never think of using a steel-tined manure fork for this work. They will carry manure in buckets to fertilize the soil, then they will shovel and throw up beds eight or ten inches high, to look nice and dry out when hot weather comes, thus making nice walks that must all be kept clean with hoe or fingers.

When this garden starts to grow, we see nice, tidy beds of onions bordered with radishes, beets or lettuce. Cabbages, set in the same plot of ground year after year, till the ground is so full of tiny white maggots, caused by the cabbage flea, that the cabbage fails because of club root. Tomatoes, planted 18 inches or two feet apart, and allowed to vine over the ground, causing much of the fruit to rot, and preventing summer cultivation of the ground. These, with parsnips, beans and cucumbers, constitute the crop in far too many farm gardens. Strawberries are no more trouble to grow than onions, but how many farmers eat them at their own tables every day during their season of ripening? Celery is another luxury that seldom finds a place in these gardens, while the sweet muskmelon and cool water melon are considered out of the question. These gardens are usually

square, or nearly so, and the palings are cut so short, and nailed so wide apart, that the chickens don't have to watch around the gate for a chance to get in. And we used always to see two or three sides of this enclosure set with currant and gooseberry bushes, and the remaining border planted with rhubarb and herbs. And oh, the labor of getting these clear of weeds and grass. But most farmer's wives are painstaking and patient, and they would rather work on the old way than go to the trouble of waking up the men to make the necessary changes.

This brings me to the second part of the question: "What the farmers' garden ought to be." First, it should be a source of pleasure and profit to the whole family. I have in my mind's eye a picture of two systems, that I have seen successfully carried out. The first is, take half an acre or more of ground in a convenient place. Make your garden three or four times as long as wide. This is to be manured, plowed, harrowed, rolled and otherwise cultivated until it is in the best possible condition. Then it is marked out as for corn, so it can all be worked with a horse and cultivator. Then the planting may begin, we will say with onions. Plant a double row in as many of the rows as may be necessary. Lettuce, radishes and parsnips are planted the same way; while beans, peas, beets and celery are planted in single rows, as far along the furrows as may be needed. Then come cabbage, tomatoes, cucumbers and both kinds of melons. The strip not needed for garden is planted with potatoes, or sown with oats or clover. This garden has currants, gooseberries, black cap raspberries and strawberries, all in straight rows for convenient cultivation. I do not know if its owner has any regular system of rotation, but I do know that his garden brings him a nice sum of money every year. This is a very convenient form for a farm garden where land is plenty. And no part of the farm pays so well for the capital and labor invested, as does the garden.

The other plan is for a small lot. The lot is enclosed by a paling fence high and close enough to exclude the chickens. The ground is liberally treated with the best manure the barn affords. This should be plowed under as early in the spring as the ground is in proper condition. Then chip, hen manure and wood ashes in small quantities may be added. The ground is to be frequently harrowed or worked with a cultivator until planting time, after that the work must be done with a hoe and iron rake. The ground is to be worked close to the fence, so there is no harbor left for weeds. The plot can then be divided into five sections. These are planted with cucumbers, muskmelons, watermelons, tomatoes and cabbage, with rows of bush beans, peas and parsnips between sections along the walks. The part intended for tomatoes is marked off with small stakes,

four feet apart each way. Between these the earliest cabbages are set, one between every two tomato plants, and a full row between the rows of tomatoes. These are set out early in May, and come off the ground before the tomatoes need all the room. Thus giving two crops off the same ground. Early beets may be planted the same way if preferred.

When the tomato plants are to be set out, strong stakes that will stand four or five feet high, are driven firmly into the ground. The plants, two feet or more in height, and in blossom are then carefully transferred from the hotbed to the holes beside these stakes and tied up with strong strings. The coarse twine used for tying fleeces of wool, is the cheapest kind of ties. These plants will require tying up two or three times during the summer, for they will each bear a peck or more of fruit, hence the necessity of using good stakes and strings. The next plot of ground is for late cabbage, and is marked off with small stakes, set about eighteen inches apart each way. About the last week in May, some good variety of late cabbage seed is planted by these stakes, just a little pinch of seed in each place, and is to be thinned out, as the plants grow, till only one plant is left in a place. Cucumbers and melons are planted in old tin cans without tops or bottoms, in the hot bed. When the weather is warm enough, these are planted in the garden, just slipped from the cans without being disturbed in the least. The advantage of this is, you do not have to fight the striped bug while your plants are small. Cabbage should never be planted two years in succession in the same ground, and cucumbers are never planted beside muskmelons. Pole beans can be planted between the hills of watermelons. Onions, celery, lettuce and strawberries are planted in other parts of the lot. Currants and gooseberries are in rows in a corner by themselves. While grapes have another corner. These are kept trimmed short and tied to low trellises. Twenty feet square of the centre of this garden is occupied by a flower bed. While gladiola, cannas, dahlias, and sweet peas, occupy all the odd corners.

I am very well aware that some of you will object to this part of the garden, as a waste of time and labor, but it is no more so than making and keeping in order nice clothes. And we know very well that all men admire a nicely dressed man or woman. And besides, we all want our children to remember the old home as the nicest place they knew in childhood.

EXPERIENCE AND OBSERVATION IN THE CULTURE OF STRAWBERRIES AND RASPBERRIES.

BY JOHN A. GAULT, *Courtney Washington County, Pa., Read at Farmers' Institute, Finleyville, Washington County, Pa., November 29, 1898.*

The subject assigned me is one in which I have taken an interest all of my life. A few weeks ago when the subject of the Farmers' Institute to be held at this place was first discussed in my hearing, I heard a farmer say that those who did the talking at these Institutes were not practical farmers, i. e., they did not know what they were talking about. Now I kept this in remembrance all the time I was writing this short essay on small fruit culture. Ever since I was a boy, I have taken an interest in this occupation, having resided on a small farm in Lincoln township, Allegheny county, Pa. Near us lived an Englishman by the name of Parkins, who was an enthusiast in everything that appertained to the culture of the soil. Strawberry culture was then in its infancy; that staid old variety, the Wilson's Albany being at that time the leading variety. Parkins had planted a small patch of this variety and the Triumph De Sand, the last named being a French variety, and was of a very good quality.

I was a frequent visitor at the home of Parkins, and I heard him often talk in his enthusiastic way of the good qualities of his strawberries, and I became as enthusiastic as he, and I determined to have a strawberry patch also; but as I had no money to purchase fencing material, I studied the situation, got my axe and cut down some trees and made them into fencing posts and palings, enclosed about one-fourth of an acre of land, plowed it, got it in condition for planting, procured the plants from my friend Parkins, and planted them and awaited results. My first venture was a success, and I had plenty of fine, luscious berries, and I assure you, I was a pretty large small boy. And as I pass by our old home on the Monongahela which I always do going to Pittsburg, my eyes often wander to the spot where I had my first experience in strawberry culture.

About this time, 1865, strawberry culture was beginning to assume some importance. Rev. Knox was planting quite extensively at Knoxville; the American Agriculturist was disseminating the Agriculturist Strawberry as a premium for subscribers, and Horace Greely was sending out the Brooklyn Scarlet to new subscribers for

the Weekly Tribune. I was a subscriber to both of these Journals, and received these strawberry premiums, planted them in my enclosure, carefully watched them, fearing they would not grow. None of these varieties (with the possible exception of the Wilson's Albany), receive any attention now, being supplanted long ago. I well remember how I kept my first strawberry plantation clean of weeds, as this is one of the greatest requisites in strawberry culture.

As to the kind of soil necessary to grow strawberries, there is a great diversity of opinion. Almost any kind of soil, if of sufficient strength and well drained, will grow strawberries. Give them plenty of cultivation; use the hoe; get down on your knees, if necessary, to get out the weeds; if you do not they will soon be master of the situation.

I think a very good distance to plant apart is four feet by twenty inches; some varieties even require more space than this. These distances are for field culture. I observed very carefully a plantation of strawberries planted by Evans Coulson, adjoining our farm, having an eastern exposure. A few years ago it was covered by a scrubby growth of young timber, but this had been taken off and the land was planted in Sharpless strawberries, the plot containing about one-third of an acre. The plants were plowed under in the autumn of 1895, given a coat of lime and stable manure, and planted in the spring of 1896, principally with Van Deeman and Dayton strawberries and some few Sharpless and Bubach. Coulson gave the plantation good cultivation, and as a result, had a fine growth of plants. During the berry season of 1897, I visited his plantation and I never saw a finer crop of berries. He harvested 104 bushels of as fine berries as ever went to market in our locality. He cultivated this plot again, after the '97 crop had been marketed, and expected to have fully as large a crop as he had the previous year, but the excessive rains during ripening season caused the crop to be short.

Last April I planted a strawberry plantation, containing about one-half acre. The ground had been planted to potatoes the two previous seasons, and had been made very fertile by heavy manuring. We plowed it very carefully and worked it down very fine. We procured our plants from W. H. Allen, Jr., of Salisbury, Md., and made the rows four feet apart, and planted sixteen inches apart in the row. I determined at the outstart, to show the neighbors how to keep a strawberry patch clean. We started out all right, run a strawberry cultivator along the rows every few days, and if a weed escaped, we went for it with either a hoe or the fingers. It was a beautiful patch of strawberries. But it began raining frequently, and sometimes two and three times a day, and by the middle of

August, it was the weediest patch of strawberries I ever saw. But we had no notion of giving it up. We got to work with the hoes, got down on our knees and used our fingers, carried the weeds off, persevered, and in the course of time had the cleanest patch of strawberries to go into winter quarters that we ever had.

A FEW RULES TO OBSERVE IN SUCCESSFUL STRAWBERRY GROWING.

Select a well-drained, rich soil, and if it does not possess the necessary fertility, apply it. Plow it carefully and work it down as fine as a garden should be. Procure good, well-rooted plants, and don't be afraid to pay more for good plants, and it will well repay you in the end. Give good cultivation, and wage a relentless war on weeds. Don't get discouraged and give it up. Cover the plants carefully in the early winter. Strawberry growing is a pleasant, healthy and honorable business, and can be made remunerative.

My experience in raspberry culture dates from April, 1882. I then planted my first plantation of raspberries, not a very large one, as it only contained 170 Doolittle and 50 Gregg plants; but some of my neighbors thought I was going into the business pretty extensively. It was at that time the largest plantation in Union township. The berries I grew on that little plantation were the wonder of the community—such a contrast between them and the wild ones that we had been in the habit of using. When I had berries for sale in 1884, from this little plantation, I purchased a crate, which I still have, and started to market raspberries; but they sold rather slowly at first, but the demand increased with each year. I had the entire market for several years, but competition became keen, and to-day there are many raspberry plantations in the neighborhood, and prices have gone away down. Raspberries can be successfully grown in two ways. They can be planted in rows six feet apart, and three feet apart in the row; this distance will suit upright growers like the Gregg, but varieties of the sprawling habit like the Souhegan require more space. The other way is to plant five feet apart each way, and cultivate both ways. This is the easier way to keep clear of weeds, and also easier to harvest. Persons who contemplate planting a raspberry plantation need not fear to get the soil too rich. They require a very strong soil; and there is no better place to plant them than in a piece of new land.

Get well-rooted plants and cultivate thoroughly. Raspberries require plenty of moisture, and the way to get it, is through cultivation. We generally tip back the young growths in June, and after being harvested, cut out the old wood that the crop has been grown upon, and cultivate the new growth; then let the bushes alone until spring, at which time we prune back the bushes that the crop is to

be grown upon, and cultivate until the berries begin to form. It was impossible to carry out this program the past season on account of excessive rains.

But to conclude. Small fruit culture is a pleasant business to engage in. True, we have our years of disappointment. Jack Frost comes around occasionally, and nips the berries in the bud, while excessive rains bring ruin to the strawberry crop, as it did the past year. But the grower of grain crops, the dairyman and stock grower, have their years of disappointment also. I have often thought if our land owners would grow more fruit, the exodus of farmer boys to the cities would be less. Farmers, plant more fruit, and you will be both healthier and happier.

SOIL, TOIL AND BRAIN.

BY MISS NARCISSA M. CRAWFORD, Woolrich, Clinton County, Pa. *Read at Farmers' Institute Woolrich, Clinton County, Pa., January 14, 1899.*

The three essentials to the successful pursuits of agriculture, are embodied, it seems to me, in this title. The first requisite for a bountiful harvest, is a good soil. Some soils are deep, others are shallow. Soil is made by the disintegrating forces of the elements upon the rocks of the earth. Some of these forces are the air, the changes in the temperature, rain, the growth of plants, and the work of earthworms. In cultivated soils, this change is helped by the cultivation of the ground.

Soils differ in nature. Some are loose and sandy, others are a light loam, and some are compact and clayey. The sandy soils are more easy to work, but often lack in productive power, and more especially lack power to retain moisture. The clayey soils, on the other hand, require careful drainage, as they hold the moisture too well.

The value of soil as regards productiveness, depends largely upon the nature of the rocks decomposed, and the chemical elements found therein. Soils may be improved. If shallow, they may be deepened by the plow; if too sandy, by being mixed with clay; if too wet, they may be drained, and if too dry, irrigated.

We might compare soil, toil and brain to a railroad; the soil to represent the road, the toil, the engine, and the brain the engineer. What is a railroad without an engine and an intelligent engineer, or

a farm without toil, and an intelligent farmer? Farming was the first occupation of man. God commanded Adam saying, "In the sweat of thy face shalt thou eat bread." Since that time it has ever been the lot of all men to labor; therefore, let us work with a will, since men of all callings are dependent upon the products of the soil. Let us change

"Every weed into a flower;
Turn each thistle to a vine;
Make the bramble eglantine."

To show what soil and toil may do without the help of brain, the following will illustrate. On a large farm through which flowed a creek, a farmer had reclaimed about ten acres of fine alluvial soil by proper drainage. He allowed it to stand one year and then planted to a crop of oats. The yield was immense. His neighbors who owned an adjoining field, encouraged by his success, tried the same plan, but with variations. They began by digging one large ditch at what seemed to them the lower end of the field, because it was further down the stream, but they failed to notice that the banks of the stream were much higher at that place; and instead of draining, the ditch made of the field a basin or reservoir, for the water poured into it during an inundation by flood. They next changed their plan by making several small ditches, and finally succeeded in draining the field. While the ground was still too wet for cultivation, they planted their first crop—fruit trees—which were a failure. Only 12 out of 600 lived. Such illustrations as this could be multiplied by the thousand, doubtless, from your own observation.

A knowledge of the chemistry of plants and soils, is necessary to determine the proper crop for a field. For instance, it would be well to know what plants require nitrogen and what soils contain it; or what plants require phosphorus, and what soils contain it, or what fertilizers would replace the lack of either.

The popular idea of farming is of two kinds. One is where the farmer gets up at four o'clock every morning of the year, works until dark every day, and receives for this a mere pittance in comparison with what may be gained in any other walk of life. On the other hand we have a picture of pleasant fields, happy workers, long summer days, singing birds, sweet smelling blossoms, a winter of rest, long, pleasant evenings, warm, cheerful fire-places, apples, nuts and good things, *galore*.

Now the truth, I fancy, lies somewhere between these two. The toil is hard and unrelenting, the recompense, in some cases, small, but the more brain is mixed with the paints in this picture, as in Angelo's, the more perfect the whole will become.

A time has come when the farmer is able to be a chemist, botanist

and geologist all in one, if he but take advantage of the opportunities all around him. Agriculture has passed successively through the different stages up to a science, and to-day we find the successful farmer has need of "soil, toil and brain."

PREPARATION OF THE SEED BED.

BY W. B. CLARK, *Mt. Jackson, Pa., Read at Farmers' Institute, Hillsville, Lawrence Co., March 7, 1899.*

The world moves and the age of progression is on the march, and the thrifty farmer will not be in the rear. The many inventions for labor saving are helping on with a great reform in many departments of farm work. This is true in cultivating and preparing the soil for the reception of the seed, from which we hope for a future crop. Our system of farming has been revolutionized. The farmer of to-day is an experimenter, rather than an imitator.

Those who have listened to discussions among even the most intelligent and successful farmers, must be impressed with the radical difference of opinion, founded on experience, which they express for obvious reasons. No other class of business men are so likely to find so many different ways of doing the same thing; hence the wisdom in understanding and feeling the importance of the calling. For we all have different ideas, and often work along different lines in pursuing the same object.

The main ideal should be to bring the work to a complete finish. The soil and fertility of our farms are not all alike. The successful treatment given to one, might not be the best for some other, for the simple reason they have not been cropped alike, and consequently, the mechanical condition of the soils require different treatment. The successful farmer has learned that before he can prepare a good seed bed, he must have something with which to make it out of. He must have a fertile soil; one that contains all the materials requisite for the nutrition of plants, in the required quantity and in the proper form. If the fertility is found deficient, a perfect seed bed cannot be prepared. It is necessary, therefore, that the farmer study the needs of the soil, work and manure in such a way as to restore the exhausted elements of fertility, and set in action any latent or dormant particles of plant food which may previously have been locked up by careless or injudicious farm-

ing. The ground is often made lifeless from soaking during winter and spring. The water should be got out of the ground so that the plant can get hold of the nitrogen in it. Wait until the ground is dry before plowing. Roll, harrow and pulverize. Mix the fertilizer well with the soil. The tender thread-like rootlets should be well fed. The plowing should be well done. The plow though it looks simple, is a scientific instrument, built on scientific principles, and its proper use requires good judgment and skill.

The plowman of Scotland is an artist. He demonstrates his skill in a furrow as straight as a line. His furrows lie side by side as level as bricks, and any over-lapping or breaking is charged to his discredit. Much of our plowing, when viewed for the first time, would make the English plowman sick. The principle object of plowing is to loosen the soil for the purpose of forming a proper bed for plants to incorporate with the manure that is applied to the soil, to destroy the sod, and to arrange the soil and its ingredients, that the materials which contribute to the growth of the plants may be converted to a soluble state and rendered available to their support when needed.

To accomplish this, it is necessary that the soil be well and thoroughly broken; and to do this, the plowman should hold the plow firm with both hands, so that it will not slip to either side, especially on the land side; and he should also be careful not to take too wide a furrow slice, which will leave a small ridge between the furrows unbroken. Be careful to break clear out at the corners. Keep the humus near the surface. This especially is needful where the soil is thin, for by this means better stands of wheat and grass can be obtained. We need organic matter all through the soil, but if the supply is limited, the nearer the surface it is kept, the better for wheat, corn and oats.

Keeping up the fertility of the soil, throws some light on the question, "how can we successfully winter over our wheat?" Too many farmers fail to give the necessary time and attention in preparing a good wheat bed. I think no one will dispute the good resulting from a fine compact soil for wheat, a bed in which all lumps are crushed and the small particles resting close together, but not fused into one mass. Moisture, air and heat can readily pass through such soil and enrich it by disintegration and decomposition. The seed will be more evenly planted on such a soil, and it will not come up in patches and ridges. Fine compact soil retains moisture better in a dry season and allows it to filter through during a surplus. Less injury will result from freezing, the finer and more compact we make the soil. The labor essential to producing such mechanical conditions, is not great. It is done best by beginning to plow early,

and following the plow immediately with the roller and harrow. It is a mistake to omit the latter process for any length of time, for the land then gets cloggy and fused together, so that it cannot be so easily pulverized.

We can afford nothing short of a thorough preparation of the soil, not even for the sake of getting the job off our hands. The thorough farmer is the one who rejoices most when he comes to gather in the sheaves.

CARE AND MANAGEMENT OF POULTRY.

BY DR. S. C. MOYER, *Lansdale, Montgomery Co., Pa.*

The requisites for profitable poultry raising are suitable buildings, properly located, healthy vigorous breeding stock, experience and good management. The location should be on high ground, easily drained. The buildings need not necessarily be expensive, but must be warm, free from drafts and properly ventilated. The roosts or perches should be on a level and placed about a foot above a platform to receive the droppings; the platform to be just high enough to make it handy for cleaning. The perch should be, at least, two inches wide and rest firmly in a notch, and be moveable to facilitate the application of coal oil whenever necessary. A very narrow perch makes it necessary for the fowl to bear its weight on the breast bone, mainly on one spot, and thus it becomes bent to one side and you have crooked breast bones.

Very many farmers fail to realize the profit they should from their poultry, because they keep too many useless or unprofitable fowls in their flock. You will find that many of their hens are three, four or even more years old, which must be housed and fed, and it will take twice the number to counter-balance the profit of the others. It will pay best to market all hens over two years in the fall before moulting season. It is of the utmost importance, therefore, to make a very careful selection of all the hens and pullets he intends to keep over. In making the selection, pay particular attention to shape, size, health and vigor of the pullets and hens that moult early and are not too fat.

Pullets hatched in March and April will give you the best results. With proper care and feeding, they will begin to lay in the fall and will continue to lay in winter, if you have warm comfortable build-

ings and give them the necessary attention. Those are the ones that you derive the most profit from. Eggs at that season are in great demand, and prices higher than at any other time in the year, and eggs will be one of the main sources of profit in poultry raising.

The custom of keeping the cockerels raised during the summer till fall is a mistake. Instead of keeping them till Christmas and New Year, when everybody is selling, it will pay better to market every one of them as soon as they get to weigh between three and four pounds. The better prices obtained will more than offset the heavier weight later in the season, besides saving in feed, and giving the pullets more room and freedom.

Having selected your hens and pullets, another important factor is the selection of males to breed from. The selection of thoroughbreds is of the greatest importance. You will thereby avoid inbreeding and impart new vigor into your flocks. It will be seen that the young resemble the male much more closely than the females, if the above suggestion is heeded. Pay more attention to practical than to fancy points in your selection, and cockerels will serve a better purpose for breeding in winter than two or more year old roosters.

You have now your buildings properly constructed and your flock selected and ready to begin operation. Allowing the chickens free range during the summer, they must be housed in the winter to obtain the best results, and each fowl to be kept should have a floor space of eight square feet. Have the houses whitewashed with crude carbolic acid added to lime, as a disinfectant and preventative of disease. Provide grit in the shape of shells, flint, gravel, coarse sand, etc. A dusting box filled with road dust is one of the necessities that cost little, but help greatly to free the hens from lice, which are the greatest enemies to profitable poultry culture. Use coal oil on the roosts and in every crack where lice harbor, and repeat two or three times in that many days to destroy the mites that may escape the first application. Keep plenty of fresh water before your fowls at all times in suitable drinking vessels. Remove the droppings at least twice a week, and keep the surroundings pure and healthy. Feed at regular hours and do not overfeed. The fowls are not themselves particular whether their food is fresh and their drinking water pure. The owner knowing the effect of food and drinking water upon the quality and flavor of the meat and eggs should attend to these. It is the attention to these small matters that makes poultry raising profitable, and in no industry on the farm is the profit greater in proportion to the labor and care bestowed. A person who has never been able to make a living at anything else, who has tried everything else, must not get into the idea that he can raise poultry profitably or make a fortune in it.

Economy must be strictly enforced, and particular attention given to details.

Another item of profit is hen manure. Ordinarily, much of it is lost by allowing it to remain on the floors and being trampled under foot and covering it with lime or ashes. The custom of mixing it with lime and ashes is wrong. They liberate the ammonia, instead of preventing its escape. Dry earth almost in any form will absorb it, thereby increasing its value. Practical experience with hen manure on small fruit has given excellent results and its value on corn and other crops is known to all farmers, which will be proportionately increased by the attention it receives.

"An ounce of prevention is worth a pound of cure," will apply a hundredfold to diseases of poultry. While diseases may and do occur in the best regulated poultry yards, yet many diseases can be prevented by proper attention and watchfulness. Roup, one of the most common and virulent diseases, is nine times out of ten caused by overcrowding the growing stock, and by drafts back of their roosting places, and when one is thus affected, contagion is the order and the whole flock will suffer, unless the sick are removed from the rest at once.

So we might go on through the whole category of diseases. It is not good policy to have the coops of the growing chicks every year in the same place, nor to have them too close together, but change the location frequently or have the ground ploughed. As a rule the chicks sleep in the same coop which was sufficient for their accommodation when small, but by their rapid growth they soon overcrowd it and fail to obtain the rest and freedom they require. They also become overheated by the heat of their bodies and warm weather, which unfits them for the sudden chill of the morning on being released from being penned up.

The old and young should not be fed together. By locating the coops of the chicks on the opposite side of the farm buildings, not in view of the accustomed feeding place of the fowls, it can in a great measure, be prevented and save considerable annoyance.

An industry of such importance to farmers demands more thorough and strict attention than it generally receives. It requires constant watchfulness and good management, coupled with common sense and perseverance, to make it profitable. No farm product affords more satisfaction, whether for profit or pleasure, than a flock of well bred and well kept poultry, and no farm or country home is complete without a well regulated poultry yard.

BUTTER MAKING ON THE FARM.

BY M. E. COWLES, *Lander, Warren Co., Pa., Read at Farmers' Institute, Lander, Pa., January 5, 1899.*

Somewhere in the attic or in the corner of some back room of most farm houses will be found a few dozen tin pans, packed securely away, perhaps, in an old dash churn, while in the loft of the granery, or in some place most out of the way, are the well preserved remains of a dog-power churn.

Just as the spade of the geologist, delving deep in the crust of the earth turns up the fossil remains of fish, bird and quadruped, which tell the story of ages that are past, so these fossils of the dairy tell the story of a past era in butter-making. Not so long past either, for those of us who have yet scarcely reached middle life, remember when that pile of dusty pans were the shining pride of the thrifty housewife. But now her care is transferred from the milk-pan to the milk-can. The dog-power has given place to the milk wagon, and the age of the creamery is here.

But to some the reign of the creamery is not altogether satisfactory. Where the milk must be drawn from two to four miles, the first half of every day is nearly spoiled for man and horse. The cost of making, when taken from the recent low prices, leaves rather an unsatisfactory income from the dairy. Then, in hot weather, the skimmed milk comes from the creamery with greatly reduced value, especially as feed for the calves, which at present we are all so anxious to see doing their best. For these reasons, perhaps, for others, many are asking whether they shall not again become manufacturers as well as producers, and make the butter on the farm.

That this can be successfully done, there is no doubt; but not by a return to the old methods. He who at present expects to succeed in making butter on the farm, must expect to make creamery butter. He must make an article that shall be as even in flavor, in salineness and in its grain as the product of the creamery. For there would seem to be no article of food about which people are more particular than their supply of butter, and those who have become used to that from the creamery are hardly satisfied with the irregular quality of the so-called dairy article. We must then leave the pans in their corner in the attic, and continue to use the dash-churn for a flour barrel.

Of the methods that shall take their place I can, from experience, speak of but one—the separator and revolving churn. With these, there is no reason why the farm should not compete very successfully with the creamery. For the man at the weighing can must take the milk as it comes, and do the best he can with it after it reaches him; while the man who is his own patron, need not have any milk that is off-quality. We may reasonably look, then, for the finest butter from the farm.

But the finest butter will not come by chance. There must be no mistake, no neglect, from the time the milk is in the pail till the butter is in its package. There must be, first of all, the most scrupulous cleanliness in both stable and dairy, for milk, like man, to whose needs it ministers, come into existence sweet and pure, but like man, is very prone to be overcome of evil. If its purity is to be retained, it must be kept out of bad company. No matter how clean the stable is kept, let us get the milk out of it as soon as possible, not leave it there in temptation, while we finish up the chores.

Be sure, too, your milk will find every den of vice in the seams of pail and can, and a veritable den of vice every seam and corner will be, if they have the slightest chance. All dairy utensils should be made with just as few seams as possible, and the man ought to have a rushing business who will make them with no seams at all. But if new seams are bad, what shall we say of the patches, and blotches of solder on old dishes? Yet such dishes are too often used for milk. While waiting in a tin shop a short time ago, I noticed a number of strainer pails, etc., which should have been pensioned and retired from the active list of dairy utensils years ago.

When the separator has done its work, there comes a part of the process of butter making that requires, perhaps, the most careful attention of all. Both quality and quantity of butter depend largely on success in ripening the cream. As soon as possible after leaving the separator, the cream should be cooled to 60 degrees or better to 50 degrees, and kept at a low temperature for several hours before ripening, then warmed to 62 or 65 degrees, a pint of buttermilk added to each five gallons of cream and thoroughly stirred in. Then all should be thoroughly stirred every two or three hours until it begins to thicken. If, when two or more skimmings are to be churned together (the cream can all be kept perfectly sweet until ready to ripen), it should all be well mixed together before ripening, but if not, let each skimming be ripened separately, then mixed and stand for a few hours before churning. In no case should sweet cream and that which is the least bit soured, be mixed together.

If possible, I would churn at such a temperature as would bring the butter in not less than 40 minutes, in summer, and not less than 20

minutes in winter, or say 58 degrees in summer and 62 degrees in winter. As soon as the butter or rather the buttermilk comes, stop the churn, and add a small pailful of weak brine for every fifty pounds of butter, then turn the churn again until the granules of butter separate from the buttermilk and float freely on top. Draw off the buttermilk and as the last runs off, dash over the butter a few dipperfuls of water, letting it drain down through the butter grains, and follow the buttermilk. Then wash twice in water at such a temperature as will just keep the butter cold enough, so it will not mass, turning the churn slowly. Salt to the taste of your customers, working just enough so as to be certain that the butter shall not be mottled. Pack from the churn, pressing very firmly into the package and repeatedly turning off all surplus brine.

But perhaps some one says, "it isn't so hard to make the butter on the farm as to sell it," but I think this difficulty is overcome by winter milking. Gilt-edged winter butter does not have to beg a market, and the market thus secured can easily be held through the summer.

These then I would suggest as the essentials to success in butter making on the farm: The most scrupulous cleanliness, in stable and dairy. Such timely and careful attention to every detail of the process as shall secure the production of an article that is always the same because always the best, and an output of butter that shall be approximately the same the year round.

TOWNSHIP HIGH SCHOOLS.

BY CLAUD D HAZEN, *Read at Farmers Institute, Hartstown, Crawford Co., Pa., February 13, 1909.*

Since listening to such an able address on the subject of township high schools, it is doubtful whether I can add any new thoughts to the subject, and you must kindly bear with me if many of my remarks savor of repetition.

It is the boast of our country, one which is incorporated in the Declaration of Independence, "we are all free and equal," but it is a great mistake, in more senses than one. And in no place is it more evident, than in the matter of education. The city young man (and you know he embraces the city young lady), has within his grasp the possibilities of a fine academic education, without one cent of outlay, while the country young man must needs confine himself to a meagre

common school education, and that often is poorly served. Can you not see that we are discriminating against some of the brightest young men and young women in our land?

It is the duty of the country father to give his child as good an education as the city child receives, thus placing them on an even start in the race of life, and ten chances to one, the country youth comes out ahead every time. But many country people cannot afford to send their children away to be educated. Therefore, it is the duty of the Commonwealth to provide such education, just as it is provided in the cities.

There are some statements, which in the language of Dr. White, "need neither proof nor elucidation." There are few people who do not admit that township high schools would be an advantage; but for the benefit of those who doubt this self-evident truth, I shall try to show that a high school would be a great step in advance for the progress of any township.

It is an acknowledged fact, that the enlightenment of a people as well as the safeguard of the nation, depends upon the education of the masses. Where then, is the greater part of the population of our country, in the rural districts or in the towns? Statistics point to the country. Why then not give to the country boys and girls the advantages of the city boys and girls? How can this be done? Some one says: "Send them to the towns." What! Send them away from the influences of home to a place where he will be enticed by the saloons and thousands of other temptations. Many a father who has sent his son to the city to be educated would have been pleased, had that son gone to his grave; for instead of the intelligent, finely educated son he had in fancy hoped would come back to him, there came back a drunken sot.

I think I hear some one say: "We educate our children at home as well as they do in the cities;" but this you do not do. Most of the district school teachers are men and women, not of the highest culture. The women, as a rule, stay only long enough to get married, and the men use the teaching profession as a stepping stone to some more congenial occupation. True, you may find here and there an "Amy Kelly"—a diamond in the rough—but they are not found at every "four corners." Go with me over this land, and in the language of Smith's "Evolution of Dodd," we will find countless "Dr. Waughops."

Keep your children at home. Send them to a central graded school. Place them under the guidance of teachers whose object is to make men and women and not mere machines. Some one may say: "Good idea, my friend; but think of the cost—the enormous cost to the township. Why! only last year I paid 2½ mills. I tell you,

sir; we can't afford it." Well let us come to the cold calculating figures in the case, and see. I believe you have fifteen teachers in your township, at an average salary of \$25 per month, the current expenses for each school would amount to about \$212, or that would amount to \$3,400 per year for the entire township. This does not take into consideration the building of school houses and the continuous repair on same. Now suppose we build a center school. Employ five teachers. Pay, on the average \$43 a month. This is the highest average of Crawford county. Hire four men to convey the children to and from the school. Then little children and delicate boys and girls will not be detained at home on account of the inclemency of the weather. The total cost will only amount to \$2,340, leaving a margin of \$1,000 to convey the children to and from school. This will them, at the same cost, give to the country a modern up-to-date graded school.

This is no mere "Utopian" scheme, existing only in the mind, but one which has been carried into practical operation, and its possibilities demonstrated. About a year ago there appeared an article in a well known Toledo paper concerning this plan of education. It also contained a cut of one of the buildings used. It was a small building containing, I should judge, about six rooms, and standing in the midst of a beautiful farming district. The old, red, white and blue waved from a tall pole in the center of the beautiful lawn. Two covered wagons with seats arranged along the sides, after the manner of an omnibus, were backed up to the entrance ways. From each wagon a stream of children were pouring into the broad halls and making their way to their respective rooms. Each grade, or perhaps each two grades, had its special teacher, and any one can see that the work done would be far in advance of what had been done previous to the adoption of the system.

But the question may be asked, what should be the education of a child who is to remain all its life upon the farm. The country school should teach children to see all there is to be seen in their lives on the farm. There should be taught civil government, mathematics, English literature, history; but their coloring should be different, so that each boy will look at them with a view to their reference to the farm. Nature should be taught, all about plants, the relations of plants to each other, the relation of plants to the insect world, and all the wonders like these, that come from them. The child can be taught to see a dozen things about the common and despised dandelion. This information will be useful in developing the mind, in training it to observe and in securing the culture that makes the broad, intelligent, well informed man.

Within the last decade, hundreds of good farms in the New Eng-

land States have been abandoned. What is the prime cause of this? The sons of the primitive farmers seek the cities and towns, where there are better educational advantages, and where he can fit himself to take a more active part in the business of the world. Where one farmer boy has made his mark in the world of finance or letters, thousands have gone to destruction.

Let us then summarize: Township high schools will furnish a means of communication between isolated farmers, bring farmers into a closer relationship with the National and State Departments of Agriculture, and the Experiment Station; provide for a farmers reading course, as well as the distribution of literature, which will lead to a more intelligent farmer class, a more profound and practical knowledge of agriculture, and above all, a grand and glorious citizenship.

OUR PUBLIC ROADS.

BY C. W. WILLIAMS, Hillsville, Pa., Read at Farmers' Institute, Hillsville, Lawrence Co., March 7, 1899.

This subject naturally divides itself into two parts, viz: What they are, and why, and what they may be, and how.

The subject is one of great importance to every one, especially to the farmers, because on the farmer, whether he is willing or not, falls almost the entire expense and consequent burden of constructing and maintaining our country roads, while at the same time, he uses them more than all others.

There are very few ways in which farmers neglect their public duties at so great a cost to their private interests, as in this matter of roads and road making.

The districts in which the importance of good roads is fully appreciated are few, and those in which a proper effort is made to secure the advantages of first class highways, are less still. The average "township road" (and let it be understood that it is this class of roads of which I speak), is indeed wretchedly constructed, consisting often of little more than the right of way fenced in or fenced out, taking its arbitrary way over hills, when it might have more easily gone around, and through swamps, undrained and unfilled, which might have been avoided, and crooked and narrow, filled with stone piles and chuck holes. This is the condition of so many of the roads in our State, that it may be accepted as the rule. The ex-

ception to this rule, however, consists in a short piece of really good road, which we occasionally find, which gives us reason to hope for better things in the near future.

It may be a little difficult to find a good reason or even a good excuse for our roads being as they are to-day. Is it because we do not know how to make good roads? Look at the excellent turnpikes they have in places, the fine condition of the streets in our towns and cities, and at the magnificent railroads in our Commonwealth, and the answer must be, no. Is it because we are not willing to bear the expense? To this the hundreds of thousands of dollars of tax levied and cheerfully paid each year for road purposes, says no. Then if we have men who know what good roads are and how to make them, and the people are willing to furnish the money with which to construct them, why don't we have them?

The reason, it seems to me, is to be found in our failure to properly appreciate their value and importance to us. We are contented to go along from day to day through the mud and over the stones, up hill and down hill, indifferent alike to the wear and tear of vehicle, harness and horse flesh, and the loss of valuable time, as we market our produce or haul home such things that we may need. We are frequently told that the strength of a chain is equal only to that of its weakest link. Just as true is it that the limit of the load your team can take to market, is what it can drag up the steepest hill on your road. It seems to me we need to wake up and set ourselves to thinking on this subject.

The difference in the load a horse can draw over a road as it should be, and over such roads as we have now, does not seem to be generally understood, or at least, not calculated upon in our daily expenses. Any one of us who have our crops of wheat to market, and no way of moving it, except the old way of packing it on the horses backs, would be surprised at the expense of marketing. Five bushels on each horse, or ten bushels for the team, would be a good load. That was under the old system. Then they found by getting a wagon they could take thirty bushels at a trip and thus complete the job in one-third of the time, with no greater expenditure of labor or force. But to save this time, we must be at the expense of harness and wagon. Can we not do better still?

We see that the horse can draw over an ordinary dirt road, three times as much as he can carry on his back, and it is just as sure that he can haul over a good macadamized road on the same wagon and with the same expenditure of power, three times the load he can over the dirt road. You need only to look at the piece of road from town to the top of the hill to prove that fact.

But let us turn to the other part of our subject: What they may be and how?

The bridle path which led from house to house of the early settlers, on the one hand, and the modern, well built railway on the other, represents the two extremes of bad and good roads, and the load that may be carried over one or the other by a given power, is as one to fifty-four. The bridle path represents little cost in its construction, in fact never cost anything, and was worth nothing when it was done. The railroad represents the best thought of our day, and a splendid example of the science and mechanical skill of the American people. It also represents the greatest cost in construction, and the greatest usefulness as well, hence, it is worth all it cost.

For the purpose of a country road which we are considering, these are alike useless; we could not use the one or go to the expense of building the other. But let us learn what lessons we can from them. First, the location should be looked after, and in this the one point kept in view is not to reduce the cost, though this is one item, but to secure such low grades as will enable it to be operated with the least possible expense. The engineer is given a limit of grade and curves, and he must work on that. He looks only to the future interests of the road, and pays little or no regard to the effect it may have on the property through which it may pass. He proceeds under the just rule, that private interests may not stand obstinately in the way of public good, but that what of individual sacrifice the general welfare of the community demands, must be made and paid for. When the location is determined upon, the engineer plans every foot of construction, and sees that it is properly built. The one moral that all this points out to us is, that in the making of our country roads, we should not be too cautious in the expenditure for construction, lest we have to make it up in annual outlays for repairs, and continual cost in loss of time and force in our daily travel over them. These people build railroads for the purpose of making a profit out of the business of carrying passengers and produce over them, and have long since learned that to reduce their transportation expenses to its lowest point, they must spare no pains to make their road as nearly level, straight and solid as possible.

When will we farmers and the supervisors we may elect to look after our roads, learn the same lessons?

Between the bridle path on the one hand and the railroad on the other extreme, may we not find a middle ground on which a roadway may be (without too much expense) constructed, that will meet our needs. I think there is. But to meet the requirements, it must be just what the railroad is—as nearly level, straight and solid as the circumstances will admit.

You ask, how can this be done? It is easier to tell how it will not which I will do first. It will not be done by following the

methods of construction and repair as we have done—throwing out the sods and loam from the ditch into the middle of the road, there to wear them and ourselves out at the same time, as we travel over them. It cannot be done by levying three thousand dollars of tax on our district and then accepting about one thousand dollars worth of actual work for the tax. A good deal of what we call working out road tax, could be more properly called wiping out the tax.

Let us now try and see how they can be made what they should be. We need a little good engineering and some common sense work, with good machinery. By the engineering, we shall be helped over and around the bad places, and by the common sense work, we shall, in the end, have stone roads over the greater part of the district. As a rule it may be laid down, that it is cheaper to avoid a hill and go around it when you can than to go over it. True the first cost may be greater, but have we not seen in the case of the railroad that this should, by no means, be the first consideration. A horse that draws one thousand pounds up a slope, one in one hundred and fifty, can only draw four hundred up a slope of one in twenty. The grade of our roads should not exceed one in forty. Thus we see that the grades of our roads are matters for serious consideration, not only as to first cost, but as to usefulness, as well. As we said a while ago, a horse that can draw one thousand pounds on a dirt road, can draw three thousand pounds upon a good stone road. So you see the stone road would be cheapest in the end.

As an illustration of the cost and durability of the stone road, some forty-five years ago, thirty six miles of turnpike between Buffalo and Albany cost \$1,120 per mile to grade and construct, and it stood the wear of more than thirty years of that heavy traffic without cutting through. With the improved machinery we now have, it should be made for much less; the greatest item of expense being, hauling the material to the place needed; in fact, I believe, that in the few years I have lived in this township, there has been tax enough levied for road purposes, to have given us good stone roads on all our mainly traveled roads, and put our by-roads in fair condition; or if we were to take the matter properly in hand, we may now have this, inside of twenty years, without raising the tax levy one mill.

That you may understand my idea of judicious expenditure of the road money (I say money, because all road tax should be paid in money), let us take our road district here and see what we can do. I have not the figures at hand to show just how much road tax has been levied each year here, but have for one or two other places in the State, and they show that in the past fifteen years the expense has been about one thousand dollars per mile for every foot of public road we have.

Suppose we have twenty-seven miles of road in this township; seven miles of that is little used, ten miles of main road that should be stoned as soon as possible, and ten miles between these two that should be made as good as they can be with dirt for the present. We have now divided the road, let us divide the money levied for repairs, taking a term of fifteen years on which to figure. The seven miles of road are little used, hence, will need little expense for the present, but two hundred and fifty dollars per mile, in the fifteen years would keep them in passable shape. This would be \$1,750 for the seven miles. We will allow five hundred dollars per mile for the ten miles of dirt road, making five thousand dollars, which would make \$6,750 for these seventeen miles of road. Take this from your \$27,000, the tax for the fifteen years, would leave you \$21,500 for the other ten miles. This would be 2,000 per mile with which to macadamize them and leave us \$1,250 for expenses that we have not counted on. Twelve hundred dollars of this two thousand should meet the expense of making each mile of macadamized road, and leave eight hundred dollars per mile to be expended in keeping these ten miles of road in repair for the fifteen years, partly, before we get them stoned, the rest for any repair the stone road may need up to that time. The more stone roads we can build each year, the less money will be needed for these roads next year, and we will have so much the more money left with which to build stone roads, thus increasing the number of miles each year.

The objection will probably be raised right here, that this will take too much money to start with, and you will tax us to death in a year or two. My answer is, let us issue bonds for a few thousand dollars to run twenty years, and go to work in earnest to make good roads, and we will save enough to pay these bonds, principal and interest long before they come due. Let us begin with our most important and mostly traveled roads, and so far as you go in any one year, make it perfect. Spend all your tax for that year upon it, excepting what you have to use to make temporary repairs on the other roads. The next year you can make a little longer piece of road, and so on each year. And before the twenty years have rolled around, my dream will have come true, and we will have a road system to be proud of, and the market value of every acre of land we have will be increased two or three dollars, on account of the cheapened transportation of our produce to our market towns and our railroad stations.

When we get our roads once in this shape, we can reduce our tax one-half and still keep them good. The time has come when we farmers will have to wake up to the fact that all our business will have to be done on good business principles. The competition has

become so great and the margin of profit so small that nothing short of this will answer in any department of our work.

Our business may be likened to a chain reaching from the soil to the consumer. This chain at first is short, the farmers own family being the principal consumers. We have added link by link to this chain taking out a weak link here and there as it was worn so it would not answer the purpose. In time the pack saddle has given place to the wagon and cars, the sickle to the self-binder, the slow weekly mail to the telegraph and telephone, by which you can go into the office in our village store and in a few minutes time contract your produce in the markets of the world. The missing link in the whole matter to-day is proper roads over which to haul our produce to the railroads or to market.

Let us lay the present methods of constructing and repairing our public roads away on the back shelf with the sickle and the pack saddle, where they belong, and bring our roads up to compare with the self-binder, railway, telegraph and telephone of our present day.

The crying need of the day, as I see it, is not more road laws or more road money. Laws are worth nothing unless they are enforced, and money useless unless it be properly used.

First, we need that the people be educated as to the advantage and need of better things. This is the foundation on which to build, then will public sentiment urgently demand the construction of proper roads at any cost. This is the motive power that will carry the whole matter to a successful end.

We read in sacred history that the walls of Jerusalem were rebuilt quickly after the children of Israel came out of bondage. Why? Because "the people had a mind to work." This is the secret of the whole matter.

ABSTRACTS OF INSTITUTE PAPERS.

We regret to say, that owing to the want of space we are compelled to present abstracts of a number of very valuable papers which were read at Farmers' Institutes held during 1898-9, containing subject matter of sufficient merit to warrant their publication in full, would space permit.

POULTRY INDUSTRY.

BY CHARLES LOGAN, *Bakerstown, Allegheny Co., Pa.*

Chickens hatched by incubator are stronger, and free from lice, and much tamer. To get the best results in egg production, the hen should never be frightened; one person should feed them; best time of the year to produce eggs for market is from October to the holidays. Chickens should be so fed and handled as to produce eggs all the year round; poultry house should have a southern exposure, kept sufficiently warm to exclude freezing; place in chicken house a stove, which serves to keep out frost and dampness.

CARE OF THE SICK.

BY DR. COOK, *Wattsburg, Erie County, Pa.*

Every home should contain a room especially arranged for the sick members of the family. This room should be on upper floor, facing the southeast, with no upholstered furniture in it; a quiet demeanor is of first importance in a nurse; visitors should generally be excluded from the sickroom; scrupulous cleanliness must be observed in room, clothing and with patient.

STRAWBERRIES.

BY F. W. DREYER, *Tionesta, Pa.*

The cultivation of this berry should become as general as the potato; plots planted to strawberry should be long and quite narrow in order

for convenience in working; rows four feet apart; plants two feet apart in row; the holes for plants should be four or five inches deep; spread roots, cover with fine moist earth; cultivate as you would a crop of corn; keep clean of weeds. Set a new bed every spring, thus insuring the best condition for fruit each season.

PREPARATION OF SOILS.

BY A. BOWER, *Landsburg, Pa.*

In order to produce good crops, it is of first importance to get the soil in proper condition. This can best be accomplished by plowing under an abundance of vegetable matter where it may decay and fill the soil with humus or good plant food; if lime is needed, scatter it on surface and harrow into ground, and thoroughly mix with soil.

THE SUCCESSFUL FARMER.

BY S. C. SARVER, *Newport, Pa.*

He looks after the details and little things which constitute a great waste on the farm; keeps his machinery in the dry and well painted; he studies the markets, and prepares his product for sale in the most presentable manner; gives his soil the most thorough cultivation, thus conserving both moisture and fertility.

HOW CAN WE MAKE THE FARM PAY?

BY JOHN G. WHITE.

To make farming pay we must produce nearly every variety of crop, and thus we will need to buy fewer things; improve wet days in repairing harness, machinery, etc. Try always to have something to sell; encourage the boys and girls to produce a good education, also in habits of industry; devise ways to make farm life attractive; thus we may have a happy and contented life.

EDUCATION FOR FARMERS.

BY L. K. McMILLAN, *Kistler, Pa.*

The farmer needs an education that would aim to develop the judgment and reasoning powers, in order that we may be able to master a thought and develop a given subject and reduce it to practice on our farms.

“Happy the man whose wish and care
A few paternal acres bound;
Content to breathe his natal air
On his own ground.”

CLAIMS OF THE COUNTRY DISTRICTS ON THE STATE TO PROVIDE GOOD ROADS.

BY W. L. McKIBBIN, M. D., *Fulton County, Pa.*

Under present system of road construction and taxation, the most sparsely settled townships share an unequal burden in the mainte-

nance of our public highways. The worst enemy of good roads is water which keeps them soft and cuts into ruts. Our roads are public highways upon which all who desire may travel; therefore, all citizens should be required to aid in their maintenance.

OUR HOMES.

BY MISS EMMA HAMILTON, *Elkin, Indiana County, Pa.*

The homes of America are the best in the world. The reason they are discussed at such meetings is for their improvement. What we are always wanting: The home should be happy; to make it so depends on the inmates; they must be industrious, unselfish, self-reliant and helpful; each individual must be educated.

COUNTRY HOMES; WHAT THEY SHOULD BE AND HOW TO MAKE THEM.

BY MRS. JOHN JEFFRES, *North Wales, Montgomery County, Pa.*

There are few things more ancient than the idea of a home. Country homes as they are and should be, are two different things. The location for home should be, first, the best spot on the farm. The building should be just the right size, convenient, bright, sunny and cheerful; the cellar dry. The inmates are part of the home, headed by husband and wife; a model mother and model father. The wife should not be overworked in the home. Environments count for much. The home should have its papers, library; the children their pets. Have flowers and music in home. The parents should join in pleasures of children. A country home should be a hospitable one. Let us profit by the mistakes of others and improve it by the means in our reach to make home a place to be loved and remembered, and its influence will go out for good to all who enter it.

FRUITS OF THIS LOCALITY; PAST, PRESENT AND FUTURE.

BY HOWARD WHITE, *Lander, Pa.*

In the past, orchards were seedling trees; a few grafts without pruning. The fruit small and fit only for cider. Gradually more orchards were planted, and better fruit sold by agents that resulted in good varieties of fruit. Every farm has its orchard and small fruits which are for home market, where they do not receive highest prices. A writer says: "That it takes a good deal of moral courage to grow fruit properly." In the future we expect to see the growers cultivate so as to have the best quality, and then each farmer will produce his own fresh fruit for every day in the year. Transportation should be such that every one can have his fruit at the best markets without being subjected to unreasonable charges by soulless corporations.

YARD AND GARDEN.

BY MISS ETTIE BROWN, *Woodberry, Bedford County, Pa.*

First. Yard should be neatly fenced and painted. Second. All filth and weeds removed. Third. A nice sward of grass, cut short with lawn-mower. Long and straggling grass looks as unsightly as a man with long and unkempt hair. Fourth. Every country-yard should have flowers growing in it.

THE TOWNSHIP HIGH SCHOOL.

BY MISS SADIE McQUEEN, *Hartstown, Pa.*

The school is the great educator; but we get a good knowledge from home influences and contact with the world. This is an age of progress; degrees of advancement of schools. Give the country child

the same advantage as in the city. How can the country child be given this advantage? By having a union of schools in a Central High Grade School. Selecting teachers fitted for different grades; the transportation of scholars to such schools; parents to be more interested in schools and directors whom they select to look after education, and they will find many more points in favor of the Central High School.

DOMESTIC ECONOMY.

BY MRS. NANNIE McCUNE, *Black Lick, Pa.*

The subject is not restricted to the finances of a home. Should bind each member of household to home. It is domestic economy to lay out money to make the home attractive and have the children who have tastes for music, literary or their own particular talent. A great gain to politics and economies in communities, if providences of God were more recognized.

BEHIND TIME.

BY T. S. INLER, *Inler, Pa.*

Many railroad wrecks occur because a train is behind time; great battles are lost because some commander failed to be in time with his soldiers; more farmers fail for the reason that they are behind the times. This applies to our education, in both practical and scientific knowledge of our soil; the kind of fertilizer to apply to produce a certain crop. The up-to-date farmer is one whose brain is active and knows how and why he does certain things on his farm.

CARE OF THE SICK.

BY MISS DOLLY WOODBERRY, *Hoffey, Pa.*

Sick persons should not be subjected to curiosity, anxiety, care, sorrow or fear. The sick chamber should be treated to a big dose of sunshine. The nurse should always wear a bright, joyous and friendly face.

HOME ADORNMENT.

BY MRS. HENRY KEAGY, *Woodberry, Pa.*

Home should be adorned with neatness and order in every room. Chaste and artistic pictures should adorn the walls; a mild and courteous demeanor should characterize the actions of all the inmates of our homes.

RELATION OF LANDLORD AND TENANT.

BY ISAAC MOCK, *Ore Hill, Blair County, Pa.*

Relations between landlord and tenant should be mutual; tenant should be intelligent, industrious, and exercise same care as if he owned the farm. Farms should be rented for a long period of time, thus giving tenant opportunity to learn soil conditions and more encouragement to keep fences and buildings in repair.

PROPER EDUCATION FOR COUNTRY CHILDREN.

BY HOMER TURNER, *Teepleville, Crawford Co., Pa.*

Farmers' girls and boys should have as good an education as the country affords. This education should be along mental, moral and social lines, remembering the old saying: "As the twig is bent the tree inclines."

A LANGUISHING INDUSTRY.

BY J. K. HARTZLER, *McVeytown, Pa.*

The planting and growing of fruit is more neglected than most other lines, especially the apple. In order to make a paying crop, only plant a few varieties, such as sell readily on the market. A good practice is for neighborhoods to plant trees of the same varieties; thus by having for sale large quantities of one kind in a given neighborhood, you are in a position to invite wholesale buyers from a distance, and secure a wide reputation as a fruit-growing section, which will insure better prices.

FARM LIFE.

BY C. B. HANAWALT, *McVeytown, Pa.*

Farm life should be the happiest life, because of pure water, fresh air and bright sunshine. What is most needed is a better education, more good books and papers. Give the boys an interest in some crop on the farm, and let him manage it, thus teaching him self-reliance. Encourage social and literary meetings; teach the children that farming is the most noble and useful occupation.

THE WIFE'S SHARE.

MRS. HARRY FULLERTON, *Mt. Jackson, Pa.*

The first need of a successful man is a wife, who feels the responsibility of making the happy home and keeping it neat and full of sunshine. She should know the finances of husband and be interested in his pursuits; should be interested in education and guide the child's mind.

SPECIALTIES IN FARMING.

BY W. J. CLARK, *Mt. Jackson, Pa.*

All branches of farming are specialties. The subject of a specialty is to secure best results and more profits. The kind of a specialty to be followed is the one most adapted to the position of farm and the inclination of farmer himself toward the special work, if he can have the choice. It requires a more practical man to be a specialist than a general farmer. A specialty of dairying should clear \$1,000 per year. The aim is to have income exceed expenses. The more industries the better for the farmer.

CARE FOR AND NURSING THE SICK.

MRS. FLORA E. KLINE, *Woolrich, Clinton Co., Pa.*

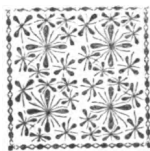
Health is "perfect circulation of pure blood in a sound organism." She speaks of health and how to avoid sickness. Good food, pure air, exercise, proper clothing. The part the physician fills. Keep the

sick room clean. Be cheerful, gentle, firm with patient; do not talk to them of their sickness or let them see you are worried about them. Do not excite patient. Follow doctor's directions; do not admit many visitors; do not leave food from one meal to another in room.

WOMEN IN THE KITCHEN.

BY MISS SARAH McNALL, *Imperial, Pa.*

It is seldom you hear of the woman in the kitchen. The papers tell of society women and club women, but not of kitchen women. The most and best women are in the kitchen. The mothers of most great men were kitchen women.



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